4.0 ENVIRONMENTAL ANALYSIS

This section of the final EIS primarily provides our analysis of impacts associated with construction and operation of the Rockaway Project and the proposed modifications at Compressor Station 195 for the Northeast Connector Project. As discussed in Section 2.3.3, the proposed uprate of the existing electric motor drives at Compressor Stations 205 and 207 would involve the use of hand tools to replace/adjust equipment within the existing compressor buildings at these sites. Except as noted in the subsections below, the proposed modifications at Compressor Stations 205 and 207 would not impact environmental resources.

4.1 GEOLOGY

4.1.1 Geologic Setting

The Rockaway Project would be located in the Embayed section of the Atlantic Coastal Plain physiographic province. The Atlantic Coastal Plain is characterized as a flat, low-lying seaward-thickening wedge of Cretaceous-age and younger sediments that slope south-southeast. These coastal plain sediments are part of a continuous surface that extends offshore where the underwater section is called the continental shelf (Isachsen et al., 1991).

Paleozoic-age crystalline bedrock underlies Long Island, New York at depths up to several hundred feet, which rise toward Connecticut. The bedrock is overlain by Upper Cretaceous-age sedimentary strata composed of unconsolidated to semi-consolidated coastal deposits of quartz sand interbedded with silt and clay (Williams, 1981). These Cretaceous deposits, which are up to 1,000 feet thick, are overlain by Wisconsin glacial deposits. Most of the Long Island coast consists of glacial outwash marked by a sinuous ridge or terminal moraine comprised of till, gravel, sand, and clay, which extends throughout western Long Island and across Staten Island. Although this and other glacial features were originally deposited on the land surface, rising sea levels caused by melting glaciers have since modified the glacial moraine by wave action.

The stratigraphy of the continental shelf has been affected by glaciation due to its position at the terminus of the Wisconsin continental ice sheet. The repeated emergence and submergence of the continental shelf by this glacier led to the dissection of the Cretaceous to early Tertiary coastal plain sediments and Quaternary material, resulting in a glacial outwash plain and modern barrier-island complexes resting unconformably over a sequence of pre-Wisconsin Pleistocene glaciofluvial and shallow marine units (Schwab et al., 2002).

Compressor Station 195, located in York County, Pennsylvania, is situated in the Piedmont Upland region of the Piedmont physiographic province, an area characterized by broad, gently rolling hills and valleys. The Piedmont Upland region developed mainly on metamorphic rocks dissected by a dendritic drainage pattern. In the vicinity of Compressor Station 195, bedrock is associated with the Paleozoic-age Octoraro Formation, which contains albite-chlorite schist, phyllite, hornblende gneiss, and granite (Pennsylvania Department of Conservation and Natural Resources [PADCNR], 2013; Pennsylvania Geological Survey, 2000).

4.1.2 Geotechnical Investigations

Transco conducted geotechnical investigations along the proposed pipeline route and at the M&R facility site for the Rockaway Project to characterize subsurface conditions in the proposed construction areas. The investigations along the pipeline route included four shallow borings located along the first 2.3 miles of the pipeline route (see the sampling report included in Appendix I) and five deep borings, one onshore and four offshore, located between MPs 2.3 and 3.0 (see the sampling report provided in Appendix J). No geologic investigations were conducted for the Northeast Connector Project.

Sediments in the shallow borings along the Rockaway Delivery Lateral route, which were examined to a depth of 8 to 10 feet, consisted of fine to very fine sand with shell fragments, particularly near the surface. The deep onshore boring, located approximately 1,200 feet east of the proposed HDD entry site, contained approximately 13.5 feet of fill (fine to medium sand with trace silt, shells, coarse sand, and glass fragments) at the surface. The fill was underlain by a natural sand stratum, interpreted to be of recent (i.e., Holocene) origin, consisting of fine to coarse sand with trace silt, shells, gravel, and mica. This stratum was present at the surface of the remaining deep borings and ranged in thickness from 35 feet onshore to around 10 feet in the three deep borings furthest offshore. These deposits were underlain by another natural sand stratum, interpreted to be Pleistocene glacial outwash deposits, consisting of fine to coarse sand with trace silt, mica, shells, and gravel. This stratum extended to the bottom of all of the deep borings and ranged in thickness from about 58 to 110 feet.

The geotechnical investigations at the M&R facility included six borings up to 50 feet deep (see the Phase II site investigation [SI] report included in Appendix K). These borings identified a layer of fill at the surface measuring approximately 15 feet thick across the site and consisting of fine to medium sand with variable percentages of coarse sand, silt, and shell fragments. These materials correspond to the fill deposits contained in the onshore boring discussed above. The fill was underlain by alluvial marsh deposits, approximately 1 to 6 feet thick, consisting of sand and silt bonded by a matrix of organic material. The marsh deposits were underlain by fine to medium sand deposits with trace amounts of silt, which continued to the bottom of the borings. This stratum, which was interpreted to be of glacial origin, corresponds to the upper natural sand stratum found in all the deep borings.

4.1.3 Mineral Resources

Based on a review of USGS topographic maps, recent aerial photography, nautical maps, the NYSDEC Environmental Navigator, and available USGS and other databases, no active mining or mineral resources are located within 1 mile of the proposed Rockaway Project facilities or within 0.5 mile of Compressor Station 195 (ESRI, 2008; NYSDEC, 2010; USGS, 2005a; USGS, 2005b). The nearest offshore borrow pit to the Rockaway Delivery Lateral is located about 2.3 miles to the east (USACE, 2013b). An offshore borrow pit is an area dredged to obtain seabed sediment for use at another site (e.g., sand for beach nourishment projects).

4.1.4 Geologic and Meteorological Hazards

Geologic and meteorological hazards are natural, physical conditions or events that can result in damage to land and structures or injury to people. Conditions necessary for the development of some typical hazards (such as landslides, avalanches, volcanic activity, and soil liquefaction) are not present in the Rockaway Project area or in the vicinity of Compressor Station 195. The hazards examined for the Projects include seismicity (e.g., earthquakes and surface faults), hurricanes, flooding, and karst terrain/sinkholes. In general, the potential for geologic or meteorological hazards to significantly affect construction or operation of the proposed facilities is low.

4.1.4.1 Earthquakes and Surface Faults

The majority of significant earthquakes around the world are associated with tectonic subduction zones, where one crustal plate is overriding another (e.g., the Japanese islands), where tectonic plates are sliding past each other (such as in California), or where tectonic plates are converging (e.g., the Indian Sub-Continent). Unlike these highly active tectonic regions, the east coast of the United States is a passive tectonic plate boundary located on the "trailing edge" of the North American continental plate, which is relatively seismically quiet. Earthquakes that do occur on the east coast of the United States are largely due to trailing edge tectonics and residual stress release from past orogenic (mountain building) events. Earthquake hypocenters generally are concentrated in older bedrock terranes, such as the crystalline bedrock beneath the coastal plain and post-glacial sediments south of New York City (Sykes et al., 2008).

A number of low magnitude events have been recorded in the vicinity of the Rockaway Project area since the 18th century. The largest recorded earthquake occurred in 1884 in Brooklyn, New York, approximately 6.6 miles west of the Rockaway Project area. This earthquake is estimated to have been a magnitude 5.5 event on the Richter scale resulting in Modified Mercalli Intensity (MMI) VII damage in the New York City area (USGS, 2010). An event such as this today would cause considerable damage to poorly built structures but negligible damage to buildings of good design and construction. The most recent significant earthquake in the New York City area was a magnitude 3.0 event that occurred in 2009 approximately 40 miles to the west (USGS, 2013a). This earthquake could be felt but resulted in little to no damage (i.e., MMI II).

Low magnitude earthquakes have also been recorded in the vicinity of Compressor Station 195. Two earthquakes with epicenters in York County and 15 earthquakes with epicenters in nearby Lancaster County have been documented since the 18th century. Where known, the magnitude of these earthquakes was 4.1 or less on the Richter scale. The nearest earthquake to Compressor Station 195 was a magnitude 4.1 event that occurred in 1984 about 15 miles to the north in Lancaster County (PADCNR, 2003).

The USGS National Earthquake Hazard Reduction Program has developed a series of maps that depict the estimated probability that certain levels of ground-shaking, expressed as acceleration due to gravity, will occur within a given period of time. To make such estimations, the USGS takes into account the past seismic history of an area. The maps are used to create and update design provisions in building codes in the United States. We assessed the probability for ground-shaking during an earthquake to occur at the proposed facilities using these maps.

The Rockaway Project facilities are located in an area where the peak horizontal ground acceleration (PGA) is 4 percent of gravity or less with a 10 percent probability of exceedance in 50 years. Compressor Station 195 is located in an area where PGA is 3 percent of gravity or less with a 10 percent probability of exceedance in 50 years (USGS, 2008). At a 10 percent probability, the frequency of exceedance (return time) for a given horizontal ground acceleration is once every 500 years. For reference, a PGA between 4 and 6 percent of gravity would result in very light to light damage and moderate perceived ground shaking. PGAs less than 4 percent of gravity would result in no potential damage and light to no perceived shaking (USGS, 2006a).

A review of the USGS Quaternary Fault and Fold Database did not identify any active faults in the vicinity of the proposed Rockaway Project facilities or Compressor Station 195. This database describes faults and associated folds in the United States that are believed to be sources of earthquakes greater than magnitude 6 in the past 1.6 million years (USGS, 2006b).

As discussed above, earthquake hypocenters in the region are concentrated in older bedrock terrains buried beneath thick deposits of younger sediments of the coastal plain and post-glacial sediments. Evidence of faulting in these younger sediments is generally missing (Sykes et al., 2008).

4.1.4.2 Hurricanes

Hazards associated with hurricanes include storm surges, heavy rainfall, inland flooding, high winds, tornadoes, and rip currents. Hurricane intensity is measured on the Saffir-Simpson Scale and ranges from a Category 1 storm with winds from 74 to 95 miles per hour (mph) that produce some damage, to a Category 5 storm with winds greater than 157 mph that produce catastrophic damage (National Weather Service, 2012). The Rockaway Project is located in an area that is considered to be within the storm surge zone of either Category 1 or 2 hurricanes (New York State Emergency Management Office, 2005). Most recently, the Rockaway Project area was in the path of Tropical Storm Irene and Hurricane Sandy. Both storms brought intense rains and flooding to the region. Hurricane Sandy, a Category 1 storm and the largest Atlantic hurricane on record, occurred in October 2012. The storm impacted a long swath of the Mid-Atlantic coastline, including many of the areas impacted by Tropical Storm Irene in August 2011 (USGS, 2013b).

Although the probability of a hurricane reaching landfall in Kings and Queens Counties in a given year is estimated to be 0.2 percent, the probability of these counties experiencing hurricane-force winds within a 50-year period is estimated to be more than 86 percent (Klotzbach and Gray, 2012). There is a 7.6 percent probability that a major hurricane will make landfall between New York City and Cape Cod, but the chance of flooding from such a storm would be reduced due to the seaward rotation and prevailing winds of the storm. There is less than a 0.1 percent chance of a major hurricane making landfall south of New York City where the landward rotation and prevailing winds could exacerbate flooding. Hurricanes are not identified as a hazard for Compressor Station 195, which is located about 115 miles inland.

We received a comment from the EPA regarding the potential for flooding to occur at the M&R facility due to a Category 3 to 5 storm, the potential increase in the frequency and intensity of these storms due to climate change and sea level rise, and any safety or other measures that Transco would implement to avoid or minimize impacts from these storms. An analysis by the New York State Emergency Management Office (2005) found that the entire Rockaway Peninsula and much of the Brooklyn-Queens area could be flooded due to Category 3, 4, or 5 hurricanes depending on the direction of prevailing winds at landfall, distance from the eye of the storm, eye wall intensity, and tide level, but the increase in risk of flooding during a major hurricane event is difficult to predict. The Intergovernmental Panel on Climate Change (IPCC) considers it likely that hurricanes will become more intense as a result of climate change and sea level rise, but the total number of storms could decline (Pachauri and Reisinger, 2007). Also see the discussion of sea level rise in Section 4.1.4.3 below.

Transco states that the ability to forecast hurricanes several days in advance would allow it to ensure the safety and integrity of its system despite any potential damage that might occur to the M&R facility. In the event of a major landfall, Transco could shut off valves and electrical systems and secure the facility to minimize impacts from the storm. As discussed in Section 4.12, shut-off valves in the system could be operated manually or remotely from Transco's Gas Control Center in Houston, Texas. Transco additionally states that it would coordinate with National Grid to minimize the impact of reduced service in the event of a major storm; test and repair equipment, as necessary, prior to resuming service; and confirm with National Grid that the local distribution network is able to receive the gas supply.

4.1.4.3 Flooding

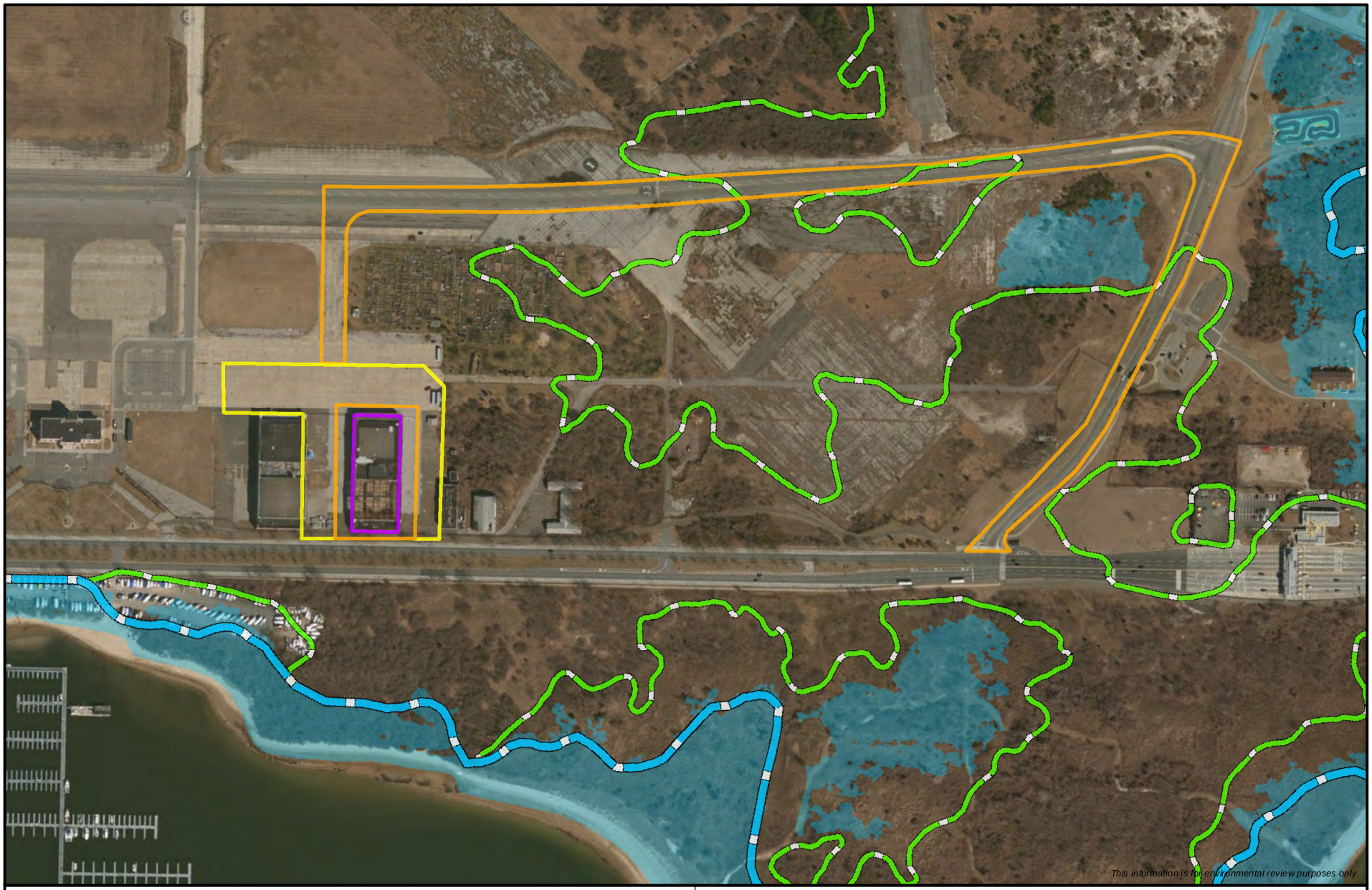
The Federal Emergency Management Agency (FEMA) produces flood insurance rate maps for municipalities across the nation (FEMA, 2012a). Following Hurricane Sandy, FEMA released advisory base flood elevation (ABFE) maps to help communities, property owners, and others in the northeast region make informed decisions about rebuilding in the aftermath of the storm (FEMA, 2012b). The ABFE maps have been replaced in most areas with preliminary work maps, which are based on the same underlying data as the ABFE maps, but use a more refined analysis of shoreline conditions along the impacted coastal area, including the effects of erosion and wave run-up (FEMA, 2013a). The preliminary work maps, which eventually will be replaced by updated flood insurance rate maps, are intended to help communities and property owners understand current flood risk and possible flood insurance requirements in the future. The maps are divided into zones with assigned probabilities of experiencing a flood event during any 1-year period. The lowest probability of flooding is 0.2 percent, which would have an average flooding recurrence interval of 500 years.

We evaluated the potential for flooding to occur at the proposed M&R facility using the preliminary work map compiled for the Rockaway Project area (FEMA, 2013a). As shown in Figure 4.1.4-1, portions of the access road to the M&R facility would be within the 500-year floodplain, though the workspace and the M&R facility itself would be located outside the 500-year floodplain. Flooding was not considered a hazard for the Rockaway Delivery Lateral, which would be a buried facility. Additionally, flooding was not considered a hazard for Compressor Station 195 because it is located outside of mapped flood zones in York County, Pennsylvania (Pennsylvania Spatial Data Access, 2013).

Transco conducted a site-specific land survey of the proposed M&R facility site to determine the elevations of the site relative to FEMA's designated 100-year floodplain (i.e., the area with a 1 percent probability of flooding in a given year). The survey determined that the lowest floor elevation inside the proposed M&R facility is approximately 2.9 feet above the 100-year floodplain delineated in the ABFE mapping (FEMA, 2012b). This is consistent with the floodplain delineated in the preliminary work map (FEMA, 2013a). For reference, the storm surges associated with Hurricane Sandy proximate to the M&R facility site were mostly contained within the 100-year floodplain (FEMA, 2013b; see Figure 4.1.4-1).

In the draft EIS, we cited Sallenger et al. (2012) who predicted that the sea level in New York City will rise between 8 and 11.4 inches by the year 2100. Based on this estimate, we determined that the M&R facility would still be approximately 2 feet above the 100-year floodplain if the sea rises to those levels. In addition, Transco stated that all wiring and electrical components (e.g., generators) would be located at least 1 foot above the floor of the facility, which would provide additional elevation for these components.

We received a comment on the draft EIS that a recent report by the IPCC (2013) predicts higher levels of sea level rise than Sallenger et al. (2012). The IPCC report predicts that sea level at a representative location on the southeast coast of Manhattan will rise from 6 to 16 inches by 2040 and 14 to 41 inches by 2100. If these projections are correct, the lowest floor elevation inside the proposed M&R facility would be above the 100-year floodplain until 2085, assuming the highest sea level rise projected. Furthermore, as discussed in Section 4.1.7, the proposed facilities would be constructed in accordance with DOT standards and the New York City building codes. Therefore, we believe that impacts associated with sea level rise and flooding are unlikely.



Permanent Footprint/ Access Road
Temporary Workspace
Proposed M&R Facility
500 - year Floodplain
100 - year Floodplain
Hurricane Sandy Storm Surge Extent
0 200 400 Feet

Figure 4.1.4-1
Rockaway Delivery Lateral and Northeast Connector Projects
Flooding Potential Proximate to the Proposed M&R Facility

NATURAL RESOURCE GROUP

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We received several comments that regulator valves at the M&R facility could become stuck in the open position due to salt water corrosion in the event of submersion due to flooding, which potentially could result in pipeline failures at low pressure downstream delivery points. Transco's design for the M&R facility includes mitigation measures that would minimize the potential for damage and control pressure within the system in the event of a flood. Transco stated that regulator and isolation valves would be installed at least 3 feet above the floor of the M&R facility, which is about 5.9 feet above the 100-year floodplain delineated in the ABFE and preliminary work map (FEMA, 2012b, 2013a). If sea level rises approximately 1 foot by 2100 as predicted by Sallenger et al. (2012), the regulator and isolation valves would be about 4.9 feet above the 100-year floodplain at the end of this century. Assuming the worst-case scenario for sea level rise predicted by the IPCC (2013), the regulator and isolation valves would still be 2.5 feet above the 100-year floodplain at the end of this century. The elevation of the regulator and isolation valves above the floor of the M&R facility would reduce the risk that this equipment would be damaged by a flood.

Pressure protection controls would be in place to mitigate risks associated with the failure of a regulator valve due to a flood or any other cause. Natural gas would be distributed through four regulators at the M&R facility as it is transferred from National Grid's 26-inch-diameter pipeline to its 8-inch, 12-inch, and 30-inch-diameter outlet pipes. Each regulator would include two regulator valves and two isolation valves. Under normal operating conditions, the operating pressure would be reduced in two phases as the gas passes through the regulators. In the event that a regulator fails, the second regulator in the series would be able to reduce the pressure of the natural gas to an appropriate level before it enters the outlet pipes, which would prevent the over-pressurization of downstream pipelines. Additionally, downstream valves on National Grid's system would be programmed to close if pressure exceeds the MAOP of the pipeline, and isolation valves upstream of the regulators could be remotely closed by National Grid's Gas Control Center to stop the flow of gas to the M&R facility.

As indicated in Section 4.1.4.2 above, Transco has stated that the ability to forecast hurricanes several days in advance would allow it to ensure the safety and integrity of its system despite any potential damage that might occur to the M&R facility. In the event of a major landfall with the potential to cause a flood, Transco could shut off valves and electrical systems and secure the facility to minimize impacts from the storm.

4.1.5 Karst Terrain/Sinkholes

Karst topography develops in regions underlain by limestone, dolomite, gypsum, or, rarely, bedded salt. Karst is characterized by closed depressions, sinkholes, caves, cave systems, and underground drainage. Generally, karst forms by the movement of water through rocks containing 50 percent or more carbonate minerals. The main factors influencing the formation of karst include: the presence of carbonate minerals, the acidity of rainwater, the ability of rock to store water (porosity), and the ability to transmit water through rock (permeability).

While karst terrain is known to occur in York County, Pennsylvania, it has not been documented in the vicinity of Compressor Station 195. Based on review of geologic data on the PADCNR's Map Viewer (2013), no known sinkholes occur in the immediate vicinity of the site. The two nearest known sinkholes are located approximately 12.4 and 16.1 miles to the north of Compressor Station 195 in Lancaster County. There is no karst terrain or any known sinkholes in the vicinity of the Rockaway Project area.

4.1.6 Paleontological Resources

The geologic units underlying the proposed Rockaway Project area are composed primarily of Wisconsin glacial deposits and recent (Holocene-age) beach and near-shore unconsolidated materials. These deposits are continuously reworked by tide and wave action, and as such, the possibility of encountering paleontological resources of significance is low.

As discussed in Section 4.2.1, soils at Compressor Station 195 formed in residuum from schist and phyllite bedrock (i.e., metamorphic rock) with a depth to bedrock greater than 60 inches. While fossils may be found in Cambrian rock outcrops in York County, the proposed construction activities at Compressor Station 195 are unlikely to impact bedrock given the shallow depth of the excavations planned at the site. Therefore, these activities are unlikely to affect paleontological remains.

4.1.7 General Impacts and Mitigation

The overall effect of the Projects on topography and geology would be minor. The primary impacts would be associated with onshore grading and excavation activities and with offshore dredging and jetting. Following construction, the workspaces on the Rockaway Peninsula and at Compressor Station 195 (with the exception of areas covered by new structures) would be returned to pre-construction conditions. At the M&R facility, the areas affected by excavations would be paved or graveled. Consequently, there would be no permanent impacts on the topography or geology in these areas.

Utilization of the HDD method would eliminate impacts on existing geologic conditions between the HDD entry and exit points for the Rockaway Delivery Lateral. Based on the HDD profile for the proposed pipeline, the subsurface material along the drill path primarily consists of fine to medium to coarse sands with traces of silt, gravel, shells, and mica. Because these materials have little cohesion, they are susceptible to cave-ins and running sand conditions that can lead to drill complications or failures. It should be noted that similar subsurface conditions exist under Jamaica Bay, where National Grid recently and successfully installed two pipelines by HDD for the BQI Project.

To minimize the potential for drilling problems, Transco would install a large-diameter casing at the onshore entry location and excavate a subsea pit at the offshore exit location. Transco would also utilize drilling fluid materials (primarily bentonite and water) suitable for the subsurface conditions along the drill path, maintain proper penetration and flow rates during drilling, and monitor the downhole annular pressure and the volume of drilling fluid and cuttings returning to the entry pit. Additionally, a drilling fluid engineer would be present throughout the HDD process to monitor and manipulate the weight and viscosity of the drilling fluid.

Transco retained an experienced HDD contractor (Laney Directional Drilling Company) (Laney) to evaluate subsurface conditions along the HDD route to confirm the feasibility of Transco's proposed HDD crossing methodology for the Rockaway Delivery Lateral. Laney (2013) concluded that the HDD method "is technically feasible for successfully installing a steel pipeline" at the shoreline crossing. Additionally, Laney confirmed that the mitigation measures identified by Transco for monitoring the HDD operation would reduce risks associated with the HDD (Laney, 2013).

Transco could encounter complications during drilling that would require modifications to the planned HDD crossing, including possibly abandoning the drill hole. Potential causes for abandoning the drill hole could include the drill pipe or tools becoming permanently lodged in the hole, a prolonged loss of drilling mud that cannot be controlled, or failure of the HDD pullback where a section of pipe cannot be retracted and has to be abandoned. If abandonment of the hole is required, the hole would be filled with soil cuttings and drilling fluid to within 5 vertical feet of the land surface. Grout would then be installed to within a foot of the surface and the last 12 inches of the hole would be filled with native materials. Following abandonment of the hole, Transco would select a new HDD alignment within the

approved right-of-way and restart the drilling process.[1] Transco's HDD Monitoring and Contingency Plan (see Appendix H) outlines additional measures that would be implemented to minimize or avoid complications associated with the HDD portion of the pipeline route. In the event that the HDD method is determined during construction to be infeasible, Transco would evaluate alternative construction methods for the area. Transco would be required to obtain the FERC's and other applicable agency approvals prior to initiating any alternative construction methods.

As discussed in Section 2.3.1.9, Transco would configure the discharge nozzles during the third pass of the jet sled to expel sediment behind the sled and into the trench. This would provide backfill as the pipeline is lowered to a depth sufficient to provide 4 feet of cover. Additional backfill would be provided by sloughing of the trench sidewalls during jetting and by natural infill as sediments migrate across and settle into the trench.

Following installation of the pipeline, Transco would conduct a hydrographic survey to document seafloor elevations along the pipe trench as well as other offshore excavation areas, such as the trenches for the subsea hot-tap and manifold and the cathodic protection system. Based on the results of the survey, Transco would backfill any areas such that the seabed is restored to pre-existing conditions and there is 4 feet of cover over the pipeline and other facilities using native sediments withdrawn from the seabed. Transco would also add a top layer of sediments over the drilling fluid and cuttings that collect within the offshore HDD exit pit both to cap these materials and restore the contours of the seafloor in this area. In addition, we are recommending in Section 4.6.3.2 that Transco file a post-construction hydrographic monitoring plan for the subsea pipeline. With the implementation of these measures, there would be no permanent impact on the seabed as a result of pipeline construction.

Studies of earthquake performance of gas transmission pipelines in southern California indicate that modern, arc-welded, ductile steel pipelines have performed very well in earthquakes with magnitudes greater than or equal to 5.8 (O'Rourke and Palmer 1996). These studies addressed the effects of 11 earthquakes between 1933 and 1994 with magnitudes ranging from 5.8 to 7.7. In addition, repair statistics show that earthquake damage occurs predominantly at older pipeline welds, and that, regardless of age, the pipe welds have generally performed well. Pipelines and associated aboveground facilities are designed and installed in accordance with DOT standards, including those in 49 CFR Part 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*. Each facility is designed and constructed to provide adequate protection from washouts, floods, unstable soils, landslides, or other hazards that could cause it to move or sustain abnormal loads. Transco has not identified any areas that require alternative design or construction considerations because of geologic hazards.

As discussed above, there is a high probability that Kings and Queens Counties could experience hurricane-force winds. It is unlikely that the pipeline portion of the Rockaway Project would be impacted by hurricane conditions following installation, but the M&R facility and surrounding structures could be affected. Transco would construct the facility in compliance with applicable New York City building codes, which were updated in 2008 to acknowledge that the city is in a "hurricane prone region." These codes include design requirements to ensure the integrity of new construction under extreme weather conditions. Additionally, as indicated above, Transco could shut off valves and electrical systems and secure the facility to minimize impacts prior to a storm making landfall. Transco's emergency response procedures are discussed in Section 4.12.

Based on the above discussion, and in consideration of Transco's proposed mitigation and our recommendations, we conclude that the Projects would not significantly impact geological resources.

[1] We received a comment from the USACE regarding the number of times drilling operations can be restarted. There is no limit to the number of times drilling operations can be stopped and restarted, but doing so increases the risk for complications or failure of the HDD. This is especially true during reaming and pull-back, which are 24-hour operations.

4.2 SOILS

4.2.1 Existing Conditions

The primary soil and sediment disturbances associated with the Projects would occur at the HDD entry point (including the onshore pipeline segment to the National Grid tie-in); along the offshore pipeline segment from the HDD exit point to the tie-in with Transco's existing LNYBL; and at Compressor Station 195. Soils at the 0.7-acre work area at the HDD entry site are mapped as Verrazano sandy loam, which consists of very deep, well-drained soils formed in less than 40 inches of loamy human-transported fill that has been piled on sandy sediments (U.S. Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS] and NPS, 2001). These soils are not designated as hydric or considered prime farmland. The sediments along the offshore portion of the pipeline route mostly consist of fine to coarse sand (as discussed in Section 4.1.2). Soils at Compressor Station 195 are mapped as Chester silt loam, which consists of very deep, well drained soils on upland ridgetops formed in residuum from schist and phyllite bedrock. These soils are not designated as hydric, but are considered prime farmland (NRCS, 2003).

Activities at the proposed M&R facility and on access roads for the Rockaway Delivery Lateral would occur in paved areas (some of which are broken and support patches of grass growing through the pavement), while activities at the pipe yard would occur on previously disturbed areas. The soils underlying these areas are classified as urban soils. Transco would not excavate any soils for the pipe yard and access roads, but would conduct excavations in fill material (as described in Section 4.1.2) for the M&R facility. These excavations would consist of pile driving and trenching for equipment foundations and the inlet and outlet pipes to connect the M&R facility to the National Grid pipeline. These activities would not result in any new impacts on natural soil resources.

Erosion Potential

Erosion is a continuing natural process that can be accelerated by human disturbance. Factors such as soil texture, structure, slope, vegetative cover, rainfall intensity, and wind intensity can influence the degree of erosion. Soils most susceptible to erosion by water are typified by bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Soils typically more resistant to erosion by water include those that occupy low relief areas, are well vegetated, and have high infiltration capacity and internal permeability. Wind erosion processes are less affected by slope angles than water erosion processes. Wind-induced erosion often occurs on dry soil where vegetative cover is sparse and strong winds are prevalent.

The potential for soils at the HDD entry site and at Compressor Station 195 to be eroded by water was evaluated based on the K factor and slope. The K factor represents a relative quantitative index of the susceptibility of bare soil to particle detachment and transport by water and is one of the factors used in the Revised Universal Soil Loss Equation to calculate soil loss. The Verrazano soils at the HDD entry location have a moderately high K factor (0.37) but are located on nearly level terrain and are considered to have a low potential for erosion by water. The Chester silt loam soils at Compressor Station 195 have a moderately high K factor (0.32) and occur on moderate (3 to 8 percent) slopes. This suggests a moderate potential for soil erosion by water at Compressor Station 195.

The susceptibility of soils to wind erosion at the HDD entry site and at Compressor Station 195 was evaluated based on the wind erodibility group (WEG) designation. A WEG is a grouping of soils that have similar surface soil properties affecting their resistance to displacement by wind, including texture, organic matter content, and aggregate stability. The Verrazano soils have a WEG designation of 3 and are considered moderately susceptible to wind erosion. The Chester silt loam soils have a WEG designation of 6 and are considered to have a low susceptibility to wind erosion.

Compaction Potential

Soil compaction modifies the structure and reduces the porosity and moisture-holding capacity of soils. Construction equipment traveling over wet soils could disrupt soil structure, reduce pore space, increase runoff potential, and cause rutting. The degree of compaction depends on moisture content and soil texture. Fine-textured soils with poor internal drainage that are moist or saturated are the most susceptible to compaction and rutting. The Verrazano soils at the HDD entry site on the Rockaway peninsula are well drained and have sandy loam texture. Therefore, these soils are considered to have a low susceptibility to compaction. Additionally, many of the soils in the Rockaway Project area already have been compacted due to past development activities (e.g., highway construction). The Chester silt loam soils at Compressor Station 195 are well drained, but they have a moderate to high available water capacity and may be subject to compaction.

Revegetation Potential

Droughty soils that have a coarse surface texture and are moderately well to excessively drained may prove to be difficult to revegetate. Drier soils have less water to aid in the germination and eventual establishment of new vegetation. Coarser textured soils have a lower water holding capacity following precipitation, which could result in moisture deficiencies in the root zone and unfavorable growing conditions for many plants. Based on these criteria, the Verrazano soils within the HDD workspace on the Rockaway Peninsula have poor revegetation potential. Although the Chester silt loam soils are well drained, they have a high water holding capacity and have a moderate revegetation potential.

Prime Farmland

The USDA defines prime farmland as "land that is best suited to food, feed, fiber, and oilseed crops" (NRCS, 1993). This designation includes cultivated land, pasture, woodland, or other lands (excluding urban land and open water) that are either used for food or fiber crops or are available for these uses. While the Chester silt loam soils at Compressor Station 195 are classified as prime farmland, the affected soils would be within the existing compressor station yard in an area that is dedicated to natural gas transmission. No portion of the existing station yard is farmed, and none of the proposed facilities would be built in areas available for agriculture.

4.2.2 Contaminated Soils and Sediments

We reviewed publicly available databases in the EPA's Envirofacts Data Warehouse to identify known contaminated soils or sediments in the vicinity of the proposed Rockaway Project facilities and Compressor Station 195 (EPA, 2013a). Our review identified one EPA-regulated facility within 0.5 mile of the Rockaway Project, i.e., New York City Fire Department Engine Company 329, which is located approximately 200 feet southeast of the HDD entry point.[2] Compressor Station 195 is the sole EPA-regulated facility within 0.5 mile of this area. Both Engine Company 329 and Compressor Station 195 are in compliance with the permits issued by the EPA for these facilities. We received a comment from the NPS that a tar-like substance associated with an old factory site is located off the south shore of Floyd Bennett Field east of the Marine Parkway Bridge. We have determined that this site is situated about 0.7 mile from the proposed M&R facility and would not be affected by construction of the Rockaway Project. Therefore, we do not anticipate that Transco would encounter any known or previously identified soil contamination during construction of the Projects.

[2] Hazardous waste generators, transporters, treaters, storers, and disposers are required to provide information on their activities to state environmental agencies, which then provide the information to regional and national EPA offices.

Transco commissioned a Phase II SI to document baseline soil and shallow groundwater conditions in the vicinity of the M&R facility and determine the presence or absence of contaminants that would require additional investigation, remediation, and/or environmental material management planning (see Appendix K). Twenty-six soil samples were collected and six groundwater monitoring wells were sampled (see Section 4.3.1.3) as part of the Phase II SI. The soil samples were submitted to an analytical laboratory for analysis of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), Resource Conservation and Recovery Act (RCRA) metals, and mercury. None of these compounds were detected at concentrations that exceed the NYSDEC's unrestricted use Soil Cleanup Objectives.[3]

Sediment samples were collected from four locations along the offshore portion of the pipeline route and analyzed for various contaminants (see Appendix I). VOCs, PAHs, PCBs, and dioxin were detected in the sediment samples, but the levels did not exceed the NYSDEC's Technical and Operational Guidance Series (TOGS) 5.1.9 Class A thresholds.[4] The samples were also analyzed for metals, including arsenic, cadmium, copper, lead (Pb), and mercury. With the exception of mercury concentrations in one sample, none of the metal values exceeded their respective TOGS 5.1.9 Class A thresholds. The surface sample (0 to 1 foot below grade) collected near MP 1.0 contained a mercury concentration of 0.22 parts per million (ppm), which is slightly higher than the Class A threshold of 0.17 ppm. The mercury levels in the samples collected between 1 and 7 feet below grade at this location and at the remaining locations ranged from 0.034 to 0.037 ppm. Because the mercury levels were slightly higher than the threshold at the surface of one sample location and were well below the threshold at the remaining sample locations, we do not anticipate any issues related to resuspension of mercury into the water column.

4.2.3 General Impact and Mitigation

Construction activities such as clearing, grading, trench excavation, backfilling, and the movement of construction equipment within the HDD entry workspace on the Rockaway Peninsula and at Compressor Station 195 may affect soil resources. Clearing removes protective vegetative cover and exposes the soil to the effects of wind and rain, which increases the potential for soil erosion. Grading, spoil storage, and equipment traffic can compact soil, reducing porosity and increasing runoff potential. In addition, the presence of certain soil conditions (e.g., droughty soils) can result in poor revegetation of disturbed areas.

To reduce the impacts of construction on soils, Transco would implement its Plan (see Appendix D) for the Rockaway Project and the FERC Plan for the Northeast Connector Project. Transco's Plan is based on the FERC Plan and includes measures to control erosion and sedimentation during construction (e.g., by the installation of silt fences) and to ensure proper restoration of disturbed areas following construction.

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[3] The NYSDEC promulgated Soil Cleanup Objectives as part of 6 NYCRR Part 375 of the Environmental Remediation Programs. The unrestricted use objectives represent the concentration of a contaminant in soil which, when achieved, will require no use restrictions on the site for the protection of public health, groundwater and ecological resources.

[4] The NYSDEC's TOGS 5.1.9 for In-Water and Riparian Management of Sediment and Dredged Material. Threshold values are based on known and presumed impacts on aquatic organisms/ecosystems. Class A is defined as no appreciable contamination (no toxicity to aquatic life).

All debris would be removed from the HDD workspace on the Rockaway Peninsula following construction, and the area would be restored to preconstruction condition and seeded with a seed mixture approved by the TBTA. Prior to seeding, the soil would be decompacted to aid in successful revegetation. Temporary erosion controls would be maintained until adequate vegetative cover is established. National Grid would then be responsible for coordinating with the TBTA for long-term monitoring and erosion control on the TBTA property. Disturbed areas at Compressor Station 195 that do not include new permanent facilities would be restored, decompacted, and reseeded using an appropriate seed mix.

Excavations for the offshore pipeline and associated facilities would impact approximately 29.0 acres of the seafloor and require the displacement of about 125,000 cubic yards of sediment (including displacement due to excavations and anchoring footprints). Backfill of the pipe trench initially would be accomplished by configuring the discharge nozzles on the third pass of the jet sled to expel sediment behind the sled and into the trench as the pipe is lowered. Backfill would also result from sloughing of the trench sidewalls during jetting and by natural infill as sediment migrates across the trench. As discussed in Section 2.3.1.9, Transco would conduct a hydrographic survey to document seafloor elevations in the construction area. Transco would backfill any areas such that the seabed is restored to pre-existing conditions and ensure there is 4 feet of cover over the pipeline and other facilities. Transco would also add a top layer of sediments over the drilling fluid and cuttings that collect within the offshore HDD exit pit both to cap these materials and restore the contours of the seafloor. In addition, we are recommending in Section 4.6.3.2 Transco file a post-construction hydrographic monitoring plan for the subsea pipeline.

Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of contamination are typically minor because of the low frequency and volumes of spills and leaks. Transco has developed and would implement the measures in its SPCC Plan and Construction Spill Plans (see Appendices F and G) to minimize the potential for impacts associated with an inadvertent spill of hazardous materials. These plans identify preventive measures to reduce the likelihood of a spill, such as secondary containment for petroleum products, daily equipment inspection for leaks, and restrictions on the transport of potentially hazardous materials to the construction work areas. These plans also address the storage and transfer of hazardous materials and petroleum products, specify measures to contain and clean up spills, and outline notification procedures in the event of a spill.

Based on the urban nature of the Rockaway Project area, it is possible that previously unidentified areas of contamination could be encountered during construction. Transco would monitor excavations during construction for evidence of potential contamination. If potentially contaminated soils are encountered during construction, Transco would implement its *Unanticipated Discovery of Contamination Plan* (see Appendix L). This plan outlines measures for the proper handling and disposal of contaminated soil and groundwater or other contaminated media that could be encountered during construction. We also note that the New York City Department of Environmental Protection (NYCDEP) recommends that Transco develop a *Construction Health and Safety Plan* for construction activities in areas where humans would be exposed to disturbed soils.

4.3 WATER RESOURCES

4.3.1 Groundwater Resources

The Rockaway Project is located within the Long Island aquifer system, which underlies all of Nassau, Suffolk, Kings, and Queens Counties, New York. The aquifer system consists of a sequence of unconsolidated deposits underlain by crystalline bedrock. The four main aquifers in the system are the Upper Glacial, Jameco Gravel, Magothy, and Lloyd (Chu, 2006). The Upper Glacial and Jameco Gravel aquifers are separated by the Gardiners Clay unit, while the clay member of the Raritan Formation separates the Magothy and Lloyd aquifers. The Upper Glacial aquifer, which directly underlies the ground surface, consists of till (i.e., ground and terminal moraine) and outwash deposited during the Wisconsin glaciation. The outwash deposits south of the terminal moraine are highly permeable and capable of yielding large quantities of water (Buxton and Shernoff, 1999). The Gardiners Clay formation is a late Pleistocene interglacial unit that extends along much of Long Island's south shore (Brown and Misut, 2010). It is a confining layer for the Jameco Gravel and Magothy aquifers, which are located below it. The Jameco Gravel aquifer consists of early Pleistocene glacial deposits and is considered to be continuous with the Magothy aquifer (Buxton and Shernoff, 1999). The Magothy aquifer is the largest of Long Island's aquifers and consists of Upper Cretaceous sand deposits alternating with clay. The Raritan Formation underlies the Magothy and consists of two primary units: an upper clay member and a lower sand member named the Lloyd Sand. The clay member serves as a confining unit for the underlying Lloyd aquifer. This aquifer is underlain by bedrock, which at its deepest is 1,800 feet below the surface (NYSDEC, 2012d).

Compressor Station 195 is located above the Piedmont and Blue Ridge Crystalline Rock Aquifer, which underlies the southern half of York County, Pennsylvania. The aquifer typically occurs at a depth of 75 to 150 feet below surface. Water storage within the aquifer occurs mostly in the unconsolidated material above non-permeable crystalline (schist) rock, but also through small fractures in the rock via secondary porosity (Pennsylvania State University College of Agricultural Sciences, 2007; York County Planning Commission, 2004).

4.3.1.1 Sole Source Aquifers

The EPA defines a sole or principal source aquifer (SSA) as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. EPA guidelines require that SSAs can have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water (EPA, 2010).

The portion of the Long Island aquifer system underlying the Rockaway Project area is not currently used as a public source of drinking water. As part of the Water for the Future Program, a number of projects are being implemented to supplement New York City's water supply, including reactivation of the groundwater supply system in southeastern Queens County. Completion of the upgrades and repairs, and subsequent start-up of the groundwater supply system, is required to be finished before 2020 (NYCDEP, 2011a). The recharge zone for this system, which includes all of Kings and Queens Counties, is designated as the Brooklyn Queens SSA (EPA, 1983). The Piedmont and Blue Ridge Crystalline Aquifer, which underlies Compressor Station 195, is not classified as a SSA.

We received a comment from the NPS regarding the potential for damage to the Rockaway Delivery Lateral as a result of subsidence due to reactivation of groundwater wells in Queens County. As noted in Section 4.1.7, pipelines are designed and installed in accordance with DOT standards to provide adequate protection from hazards like subsidence that could cause it to move or sustain abnormal loads.

4.3.1.2 Water Supply Wells

In 1996, New York City purchased a group of wells in southeastern Queens County that had been operated by the privately owned Jamaica Water Supply Company since 1887. After acquiring the wells, the NYCDEP renamed the group of wells the Groundwater System (NYCDEP, 2011b). The closest of these wells is approximately 3.0 miles northwest of the Rockaway Project area (Misut and Monti, 1999). In 2007, the Groundwater System operated one well for 2 months of the year, which supplied an average of 1.1 million gallons of drinking water per day. This equated to less than 0.1 percent of New York City's total usage and provided drinking water to fewer than 100,000 people. In 2008, the wells in the system were not operational and were reported as mechanically inactive, for emergency use, or having poor water quality (NYCDEP, 2011b). Currently, public water supplies for residents of Kings and Queens Counties are derived entirely from the surface water reservoir system in upstate New York (NYCDEP, 2011a). As discussed above, the city plans to reactivate the Groundwater System by 2020.

An active water well providing Compressor Station 195 with potable water is located within the station yard. Additionally, one well that provides potable water to an adjacent residence is located within 20 feet of the station boundary. There are no other water wells within 150 feet of Compressor Station 195.

4.3.1.3 Contaminated Groundwater

Groundwater quality in Kings and Queens Counties, New York is deteriorated due to the lowering of groundwater levels and other factors associated with urbanization and development. In addition to the encroachment of salt water from the surrounding tidewater in response to excessive drawdown, other sources of contamination include road salts, leaking sewers, and toxic spills at the land surface (EPA, 1983). The portion of the Upper Glacial aquifer underlying the Rockaway Peninsula, where HDD activities would occur, has historically been subject to saltwater intrusion (Buxton and Shernoff, 1999). This has resulted in high levels of chloride in the groundwater, particularly in nearshore areas. Chloride contamination can also be attributed to inland surface sources, especially in northwest Queens County, where saltwater intrusion is unlikely. High concentrations of nitrate in groundwater indicate contamination from surface sources, such as fertilizers, landfills, leachate from cesspools and septic tanks, and leaky sewer lines (EPA, 1983).

Transco commissioned a Phase II SI to document baseline conditions of the soil and water in the vicinity of the M&R facility and to determine the presence or absence of contaminants that would require additional investigation, remediation, and/or environmental material management planning. Groundwater samples collected from one existing and five new groundwater monitoring wells were analyzed for VOCs, PAHs, PCBs, priority pollutant metals, and mercury. None of these compounds were detected at concentrations above the NYSDEC's TOGS thresholds for the GA Water Classification (i.e., source of drinking water (groundwater)).[5]

As discussed in Section 4.2.2, one EPA-regulated facility was identified in close proximity to the Rockaway Project area (i.e., New York City Fire Department Engine Company 329), which is located approximately 200 feet southeast of the HDD entry point. Given that Engine Company 329 is in compliance with its hazardous waste handler permit, we do not anticipate that Transco would encounter any groundwater contamination associated with this facility.

There are no known areas of groundwater contamination in the vicinity of Compressor Station 195. As noted in Section 4.2.2, Compressor Station 195 is the sole EPA-regulated facility in this area, and it is in compliance with the permits issued by the EPA for the facility. Therefore, we do not

[5] NYSDEC's Technical and Operational Guidance Series 1.1.1 for Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations. These standards and guidance values outline measures of purity or quality of groundwater in relation to its reasonable or necessary use.

anticipate that Transco would encounter any known groundwater contamination associated with operations at Compressor Station 195.

4.3.1.4 Groundwater Impacts and Mitigation Procedures

At Compressor Station 195, groundwater resources are unlikely to be directly affected by construction activities because the groundwater occurs at depths greater than the proposed limits of excavation. Perched or near surface groundwater, if present, could be affected by soil disturbing activities and/or trench dewatering. These impacts would be minimized or avoided through implementation of the FERC Plan as well as any applicable state permits for trench dewatering. During construction of the HDD portion of the Rockaway Delivery Lateral, groundwater may be encountered, but construction is not expected to result in any adverse impacts on groundwater.

Groundwater resources in the vicinity of Compressor Station 195 and the onshore construction areas associated with the Rockaway Delivery Lateral (i.e., the HDD entry site, tie-in to National Grid, and M&R facility) could be vulnerable to contamination if there is an inadvertent surface spill of hazardous materials during construction. Accidental spills and leaks of hazardous materials associated with equipment trailers, refueling or maintenance of vehicles, and storage of fuel, oil, and other fluids pose the greatest risk to groundwater resources. If not cleaned up, soils contaminated by spills or leaks could leach and contribute to groundwater contamination.

Transco would implement the measures identified in its SPCC Plan for the Rockaway Project (see Appendix F) and in its Construction Spill Plans for the Projects (see Appendix G) to minimize the potential for groundwater impacts associated with an inadvertent spill of hazardous materials. These plans identify preventive measures to reduce the likelihood of a spill, such as secondary containment for petroleum products, daily equipment inspection for leaks, and restrictions on the transport of potentially hazardous materials to construction work areas. These plans also address the storage and transfer of hazardous materials and petroleum products, specify measures to contain and clean up spills, and outline notification procedures. Therefore, the potential for the Projects to contaminate local aquifers or water supply wells would be minimal.

Prior to the start of construction activities for the M&R facility, Transco would collect another series of groundwater samples from the monitoring wells to confirm that groundwater does not contain contamination. In the event that regulated compounds are identified at concentrations above NYSDEC TOGS 1.1.1 action levels, Transco would implement its *Unanticipated Discovery of Contamination Plan* (see Appendix L). This plan outlines measures for the proper handling and disposal of any contaminated soil and groundwater that may be encountered as a result of construction activities on the Rockaway Peninsula.

4.3.2 Surface Water Resources

The Rockaway Project would cross the Atlantic Ocean Long Island Sound basin, which drains most of New York City and all of Long Island, including the Rockaway Peninsula. The surface water resources of this drainage area include all the marine waters in New York Harbor, Long Island Sound, Block Island Sound, and Lower New York Bay/Raritan Bay.

Marine environments are influenced by prevailing winds and ocean currents. In the Rockaway Project area, nor'easters and winds associated with tropical storms can cause extreme wave events. The remaining wave action is due to semi-diurnal tides, a constant occurrence within the Rockaway Project area, with a mean annual range of 4.1 feet. These wave energies generate the migration of sand westward along the south shore of Long Island.

The one surface water that would be affected by the Projects is the Atlantic Ocean. No surface waters are present within the proposed workspaces associated with the onshore pipeline, M&R facility, and pipe storage yard, or the yard at Compressor Station 195.

4.3.2.1 Water Classifications

Section 303(d) of the CWA requires that each state review, establish, and revise water quality standards for the surface waters within the state. States develop monitoring and mitigation programs to ensure that water standards are attained as designated. Waters that fail to meet their designated beneficial use(s) are considered impaired and are listed under a state's 303(d) list of impaired waters.

All waters in New York State are assigned a letter classification by the NYSDEC that denotes their best uses. Letter classes such as A, B, C, and D are assigned to fresh surface waters, while letter combinations such as SA, SB, SC, I, and SD are assigned to saline (marine) surface waters. Best uses of surface waters may include drinking water source, swimming, boating, fishing, and shell fishing.

The offshore segment of the Rockaway Delivery Lateral is located in an area designated as a Class SA saline (marine) surface water (6 NYCRR Part 701). Class SA waters are suitable for fish, shellfish, and wildlife propagation and survival. These waters support primary and secondary recreation and fishing activities and shell fishing for market purposes. The physical water quality standards that apply to this water class designation, as identified in 6 NYCRR Part 703 (Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations), are listed in Table 4.3.2-1.

Sensitive Waterbodies

By reviewing various databases and consulting with relevant agencies, Transco identified a portion of the Atlantic Ocean within the Rockaway Project area as EFH. EFH consists of waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. An EFH assessment for the offshore Rockaway Project area is presented in Section 4.6.3.

4.3.2.2 Existing Water Quality

In 2011, the NYSDEC released the *Atlantic Ocean/Long Island Sound Basin Waterbody Inventory/Priority Waterbodies List Report*. This report provides a water quality assessment for the Atlantic/Long Island Sound Basin and the Atlantic Ocean Coastline (1701-0014) waterbody segment, which includes the offshore section of the Rockaway Delivery Lateral. The area that would be crossed by the pipeline supports healthy shellfish propagation and is open for harvesting (NYSDEC, 2010).

Transco conducted field studies in the summer of 2009 and fall of 2010 to evaluate existing water quality along the offshore route for the Rockaway Delivery Lateral (see Appendices M and I). Water quality samples were collected from three depth strata (bottom, middle, and surface) at sampling stations along the route using a submersible pump. The testing parameters shown in Table 4.3.2-2 (i.e., temperature, dissolved oxygen, salinity, turbidity, and pH) were selected from a sampling plan developed with agency approval according to the NYSDEC's TOGS 5.1.9.[6] The sampled values obtained from the testing are consistent with ranges found in historical reports and with New York State's minimum water quality standards. Other parameters analyzed included biological parameters such as low and total fecal coliform bacteria concentrations and chemical parameters such as total phosphorus and nitrogen. The testing results for these parameters likewise were consistent with historical findings and New York State's water quality standards. Test results for total suspended solid (TSS) concentrations ranged from 1.4 to 18 milligrams per liter (mg/L) but in the majority of samples were less than 6 mg/L. A full list of all parameters and their thresholds is presented in Transco's Fall 2010 Sampling Report, which is provided in Appendix I.

[6] NYSDEC's Technical and Operational Guidance Series 5.1.9 for In-Water and Riparian Management of Sediment and Dredged Material.

TABLE 4.3.2-1
Physical Water Quality Standards at the Proposed Project Site for the Rockaway Project [a]

Parameter	Standard
Taste, color, and toxic and other deleterious substances	None in amounts that will adversely affect the taste, color, or odor thereof or impair the waters for their best usages.
Turbidity	No increase that will cause a substantial visible contrast to natural conditions.
Suspended colloidal and settleable solids	None from sewage, industrial wastes, or other wastes that will cause deposition or impair the waters for their best usages.
Oil and floating substances	No residue attributable to sewage, industrial wastes, or other wastes or visible oil film nor globules of grease.
Garbage, cinders, ashes, oils, sludge and other refuse	None in any amount.
Phosphorus and nitrogen	None in amounts that will result in growths of algae, weeds, or slimes that will impair the waters for their best usages.
pH	The normal range shall not be extended by more than one-tenth (0.1) of a standard pH unit.
Dissolved oxygen	Chronic: Shall not be less than a daily average of 4.8 mg/L.
	Acute: Shall not be less than 3.0 mg/L at any time.
Total coliform (number per 100 mL)	The median most probable number value in any series of representative samples shall not be in excess of 70.

[a] Standards listed are for Class SA saline surface waters as identified in 6 NYCRR Part 703 (Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations).

Notes:
mg/L = milligrams per liter
mL = milliliters

TABLE 4.3.2-2
Comparison of New York State's Water Quality Standards and the 2009 and 2010 Survey Results for the Rockaway Project

Water Quality Parameters	Historical Records/New York State Minimum Standards	Summer 2009 Sampling Results		Fall 2010 Sampling Results	
		Mean	Range	Mean	Range
Temperature	36 °F [a] to 72 °F [b] (2.2 °C to 22.2 °C)	66.0 °F (18.9 °C)	64.7 °F to 66.1 °F (18.14 to 18.95 °C)	51.1 °F (10.6 °C)	49.3 °F to 52.9 °F (9.6 to 11.6 °C)
Dissolved oxygen	4.8 mg/L	8.4 mg/L	7.9 to 9.1 mg/L	8.1 mg/L	6.7 to 9.7 mg/L
Salinity	20 to >30 ppt	29.5 ppt	28.7 to 30.5 ppt	33.5 ppt	31.4 to 35.0 ppt
Turbidity	5.0 NTU	2.5 NTU	1.9 to 3.4 NTU	2.2 NTU	0.0 to 9.4 [c] NTU
pH	6.4 to 8.6	7.8	7.6 to 7.9	8.0	7.8 to 8.1

Sources: New York State Department of Environmental Conservation, 2010; Ecology and Environment, Inc., 2011; Bruno, M. S. and A.F. Blumberg, 2009.

Notes:
°F = degrees Fahrenheit
°C = degrees Celsius
Mg/L = milligrams per liter
ppt = parts per thousand
NTU = nephelometric turbidity unit

[a] Winter average.
[b] Summer average.
[c] This value represents an outlier that may reflect unusual sediment disturbance during sampling.

4.3.2.3 General Impacts and Mitigation

Post-Lay Jet Sled

Transco proposes to use a lay barge to fabricate the offshore pipeline and a post-lay jet sled to bury the first 2.15 miles of the pipeline to a depth of 4 feet below the seafloor (see Section 2.3.1). The operation of this equipment, particularly the excavation of the pipeline trench, would impact ocean waters by disturbing bottom sediment, resulting in increased turbidity and suspended solids. The propulsion of construction and support vessels could also disturb sediments and contribute to increases in turbidity from wake effects or the creation of a slipstream, but this is not expected to be much different than the ambient conditions created by other vessels that transit the area.

Turbidity resulting from the resuspension of sediments could reduce light penetration and photosynthetic oxygen production. Resuspension of deposited organic material and inorganic sediments could cause an increase in biological and chemical use of oxygen, potentially resulting in a decrease of dissolved oxygen concentrations in the affected area. Lower dissolved oxygen concentrations could cause temporary displacement of motile organisms, such as fish, and may kill non-mobile organisms within the affected area. For a more detailed discussion of these potential effects, see Section 4.6.3.

The extent of impacts from the Rockaway Project on water quality would depend on sediment particle size, ambient currents, and the degree and rate of sediment disturbance. In general, the effects would be localized and of short duration. Transco used an estuarine, coastal, and ocean model (ECOM) to evaluate the duration and extent of the anticipated turbidity and suspended solids from offshore dredging and jetting (see Section 4.6.3). The ECOM is a hydrodynamic and sediment transport framework that has been applied to other projects in the New York area. The ECOM performed three-dimensional hydrodynamic simulations in model cells in a wide area surrounding the proposed pipeline route. The primary use of the hydrodynamic model is to estimate water velocities in each cell of the model grid. The model results are based on measurements from tide gauges, flow gauges, and weather stations located near the offshore Rockaway Project area. The ECOM evaluated the effects of three passes of the jet sled along the offshore pipeline as well as the effects of hand-jetting and dredging activities.

The analysis indicates that the maximum TSS concentrations where jet sled trenching is conducted may reach high levels in the middle to bottom layers of the water column, but would not cause sediment to be suspended at the surface. The TSS concentrations would decrease with distance from the trench. The modeling predicts that TSS concentrations at or above 50 mg/L (which is the threshold for both chronic and acute toxicity due to dredging activities under the New York State TOGS 5.1.9) would extend up to 0.6 mile from the pipeline trench during jetting. The duration of the plume from the jet sled would be inversely related to the trenching rate, and the water column plume would dissipate within 3 hours after the jetting operation ends. The speed with which ambient conditions would return is largely due to the coarseness of the bottom sediments; larger sand particles tend to settle more quickly than finer particles such as silt and clay. The modeling also indicates that a sediment plume with average TSS concentrations greater than 50 mg/L would extend approximately 1.2 miles from the hand-jetting locations (including the anode bed) and 0.3 mile from the dredging location at the HDD exit pit, but these activities would not cause sediment to be suspended in the upper layers of the ocean.

The modeling results indicate that the areas closest to the work area would be subject to the highest levels of sedimentation as a result of jet sled trenching, but the depth of the redeposited sediments would diminish as the distance from the jetting operation increases. The modeling predicts that average trenching-induced sedimentation greater than 1.2 inches would be confined to the area within 100 feet of the trench centerline, and that average trenching-induced sedimentation would not exceed 0.4 inch at

distances greater than 800 feet from the trench. See Section 4.6.3 for more detailed discussion of the modeling results.

Horizontal Directional Drill

The remainder of the offshore pipeline would be installed using the HDD method (see Section 2.3.1.5). Dredging activities associated with the HDD exit hole would have similar impacts to those discussed above. The primary impact that could occur outside of the exit hole is an inadvertent release of drilling mud directly or indirectly into the ocean.[7] Drilling mud may leak through previously unidentified fractures in the material under the seafloor, in the area of the mud pits or tanks, or along the drill path due to unfavorable ground conditions. Although drilling mud consists of nontoxic materials, the release of drilling mud in large quantities into a waterbody could affect fisheries or other aquatic organisms by causing turbidity and/or by temporarily coating the waterbody bed with a layer of clay. The probability of an inadvertent release is greatest when the drill bit is working near the surface (i.e., near the entry and exit points). As discussed in Section 4.1.7, the HDD would be located entirely in unconsolidated sandy sediments. The risk of an inadvertent release of drilling fluid when drilling through unconsolidated sediments is difficult to predict. Drilling fluid generally follows the path of least resistance, which in most cases would be along the path of the drill, back to the drill entry or exit hole.

Transco would implement measures outlined in its HDD Monitoring and Contingency Plan (see Appendix H) to minimize the risk of HDD complications and the potential for inadvertent releases of drilling fluid. Transco would monitor the downhole annular pressure and the volume of drilling fluid and cuttings returning to the entry pit to identify a potential release. Visual inspection of the ground surface between the entry point and the shoreline would also be conducted at a minimum of twice daily. If drilling fluid is not flowing to the entry or exit pits (a condition indicating a higher potential for inadvertent releases), then inspection personnel would continuously monitor the ground surface until completion of the pilot hole.

Because the HDD exit hole would be located in the Atlantic Ocean, the drilling operations associated with the installation of the pipeline are expected to result in a planned release of about 12,000 to 15,000 cubic yards of drilling fluids and cuttings into the water within the offshore HDD exit pit. As discussed in Section 4.6.3.2, the drilling fluids and cuttings are expected to remain within the HDD exit pit and are not expected to cause a significant amount of turbidity outside of this location. Additionally, the discharge would be subject to requirements identified in applicable standards and permits, such as the New York State water quality standards and the NYSDEC's water quality certificate, including any requirements associated with discharge of additives in the drilling fluid.

Transco did not identify any formal monitoring procedures for inadvertent returns of drilling fluid in the area between the shore and the offshore exit pit, but stated that inspection personnel on the vessels beyond the exit pit would visually inspect the areas at a minimum of twice daily. If an inadvertent drilling fluid release is detected offshore, outside of the HDD exit pit, Transco committed to monitoring and documenting the release.

[7] An inadvertent release refers to an unplanned discharge of drilling fluid which escapes the drill hole and is forced by annular pressures through the subsurface substrate (e.g., through cracks) to the surface (ground or seafloor).

In comments on the draft EIS, both the USACE and NOAA Fisheries recommended that Transco prepare a response plan for offshore inadvertent releases that occur outside the HDD exit pit. Because of the potential impacts associated with an inadvertent release of drilling mud offshore, **we recommend that:**

- **Prior to construction of the Rockaway Delivery Lateral, Transco should update its HDD Monitoring and Contingency Plan to include response procedures for offshore inadvertent releases of drilling fluid. The updated plan should be filed with the Secretary for review and written approval by the Director of OEP.**

Backfilling

As discussed in Section 2.3.1.9, backfill of the pipe trench initially would be accomplished by configuring the discharge nozzles on the third pass of the jet sled to expel sediment behind the sled and into the trench as the pipe is lowered. Backfilling would also be provided by sloughing of the trench sidewalls during jetting and by natural infill as sediments migrate across and settle into the trench. Following installation of the pipeline, Transco would conduct a hydrographic survey to document seafloor elevations along the pipe trench as well as other offshore excavation areas. Based on the results of the survey, Transco would backfill any areas such that the seabed is restored to pre-existing conditions and there is 4 feet of cover over the pipeline and other facilities using native sediments withdrawn from the seabed. Transco would also add a top layer of native sediments over the drilling fluid and cuttings that collect within the offshore HDD exit pit to cap these materials and restore the contours of the seafloor in this area. In addition, we are recommending in Section 4.6.3.2 that Transco file a post-construction hydrographic monitoring plan for the subsea pipeline to ensure that seafloor contours are restored.

If necessary, additional backfill of the pipe trench would be accomplished using a suction dredge, which would withdraw sediment from the seafloor in areas adjacent to the pipeline and discharge it to the trench. A minor increase in the amount of suspended sediment in the vicinity of the trench would occur due to operation of the suction dredge. The impacts on water quality would be similar to those associated with operation of the jet sled as described above, but on a smaller scale. As indicated in Section 4.6.3.2, Transco's ECOM predicts that average TSS levels due to operation of the suction dredge would not exceed 50 mg/L in the bottom layer of the water column at distances greater than 300 feet from the trench. Additionally, average sedimentation levels due to operation of the suction dredge would not exceed 0.1 inch.

Water for the HDD and Hydrostatic Testing

Transco estimates that the HDD operations would require approximately 12,000 to 15,000 cubic yards of drilling fluid, of which 95 to 98 percent would consist of fresh water. This equates to approximately 2.3 to 2.8 million gallons of fresh water. The water for the HDD operation would be obtained from fire hydrants located near the entry hole on TBTA property.

As discussed in Section 2.3.1.11, Transco would hydrostatically test the HDD pipeline segment before and after it is installed and would hydrostatically test the entire pipeline before it is placed in service. In total, Transco would use 578,700 gallons of water for these tests. Nearly all of this water (about 573,500 gallons) would be seawater withdrawn near the offshore pipeline, but a small portion, about 5,200 gallons, would be fresh water obtained from a municipal source. This freshwater would be used to replace seawater that is lost during the tie-in operation. The seawater would be filtered through a mesh screen with a mesh opening of 0.0029 inch (0.07 millimeter) to prevent debris and foreign material from getting into the pipeline. The water would be sucked into a submersible pump located about 20 feet below the ocean surface at a rate of about 4,000 gallons per minute (or about 2 hours to fill the entire pipeline). An oxygen scavenger and non-oxidizing biocide would be added to the saltwater withdrawn

from the ocean for the hydrostatic testing to prevent corrosion of the pipeline interior, and a non-toxic florescent dye would be added to help detect potential leaks (see Section 4.6.3.2 for a description of the additives).

Following each hydrostatic test, the seawater would be discharged back to the ocean in accordance with applicable standards and permits, such as the New York State water quality standards and the NYSDEC's water quality certificate. The water would be pumped into a multi-port diffuser and discharged at a rate of approximately 2,000 gallons per minute (or about 4 hours to discharge the entire pipeline). Use of the diffuser during discharge would re-oxygenate the water and dilute the concentrations of the scavenger, biocide, and dye prior to entering the ocean. The test water would be dispersed (diluted) at a rate of about 15:1 as it is discharged to the marine environment and mixes with the ocean water. Information on the ecotoxicity of the scavenger, biocide, and dye is discussed in Section 4.6.3.2.

Another 82,000 gallons of water would be used to hydrostatically test the M&R facility components on-site. This water would be obtained from a local (i.e., Brooklyn) municipal source or trucked to the site from another municipality in the vicinity of New York City. No chemicals would be added to the water, and the equipment to be tested would be clean and free of petroleum products or other potential contaminants. Following testing, the test water would be discharged into the existing stormwater drainage system that runs under the hangars on NPS property and connects to the New York City stormwater system.

We received a comment from the NYCDEP that Transco identify the maximum flow rate for withdrawals of municipal water for hydrostatic testing and coordinate with NYCDEP staff for exceptional flow rates. Therefore, **we recommend that:**

- **Prior to construction of the Rockaway Project, Transco should consult with NYCDEP staff to identify and address agency concerns regarding flow rates for withdrawals of municipal water for hydrostatic testing and file documentation of the consultation with the Secretary.**

Approximately 46,000 gallons of water would be required for hydrostatic testing of the piping modifications at Compressor Station 195. Transco would obtain this water from the onsite potable water well and discharge it to an upland area within the station site in accordance with applicable state permits.

Offshore Spills and Leaks

Accidental spills and leaks of hazardous materials (e.g., fuel or oil) associated with the barges and other vessels that would be utilized during offshore construction activities could result in a degradation of water quality and/or impacts on wildlife and aquatic resources if not managed properly. Transco stated in its SPCC Plan that emergency response procedures for offshore spills would be identified after the contractor has been selected. Due to the potential impacts associated with the release of oil or other hazardous materials to the ocean during construction, **we recommend that:**

- **Prior to construction of the Rockaway Project, Transco should update its SPCC Plan to include specific measures that would be implemented to identify, control, and clean up any accidental leaks or spills from offshore construction vessels. This information should be filed with the Secretary for review and written approval by the Director of OEP.**

Operation

Operation of the Rockaway Project periodically would impact water quality in the vicinity of the interconnection of the proposed pipeline with the existing LNYBL. Transco plans to perform periodic maintenance activities in accordance with 49 CFR 192 that would include accessing the buried subsea manifold approximately once every 7 years to install a removable launcher and conduct an internal inspection of the pipeline. The subsea manifold would be exposed using the hand-jetting method, which would affect about 0.82 acre of seabed and displace approximately 2,000 cubic yards of sediments. This would be approximately 16 percent of the sediments displaced during the initial hot-tap installation. The displaced sediments are expected to settle in a similar pattern but not extend as far from the area disturbed by construction.

Conclusion

Construction and operation of the Rockaway Delivery Lateral would result in short-term, temporary impacts on water quality within the Atlantic Ocean. With the implementation of Transco's proposed mitigation and our recommendations, we conclude that these impacts would not be significant.

4.3.3 Wetland Resources

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration to support a prevalence of wetland vegetation adapted for life in hydric (saturated) soils. Wetlands can be a source of substantial biodiversity and serve a variety of functions such as flood flow attenuation, sediment retention, nutrient retention, wildlife habitat, groundwater recharge and discharge, recreation, and erosion control. In addition, wetlands naturally improve water quality conditions.

Section 404 of the CWA established standards to minimize impacts on wetlands under the regulatory jurisdiction of the USACE. These standards require avoidance of wetlands, where possible, or minimization of disturbance, to the degree practicable, where impacts are unavoidable. Any wetland crossings would be subject to review and approval by the appropriate regional district of the USACE, including the provisions of any required wetland compensatory mitigation.

The proposed Rockaway Delivery Lateral crosses one wetland area that is classified by the NYSDEC as a littoral, tidal wetland and by the National Wetland Inventory as a marine, intertidal unconsolidated shore (see Figure 4.3.3-1). Transco is proposing to cross under this area using the HDD construction method. This crossing method would avoid direct impacts on the wetland during construction and operation of the proposed pipeline. The only potential impacts on the wetland would be from an inadvertent release of drilling fluid during the HDD. Because the drill path would be up to 100 feet below grade where it crosses under the wetland, the likelihood of an inadvertent release reaching the surface is low. Additionally, Transco would monitor the area above the HDD crossing during drilling operations to identify and clean up inadvertent releases if they occur. No wetlands are present at the proposed M&R facility, the pipe yard, or Compressor Station 195. For all these reasons, we conclude that the Projects are unlikely to affect wetlands.

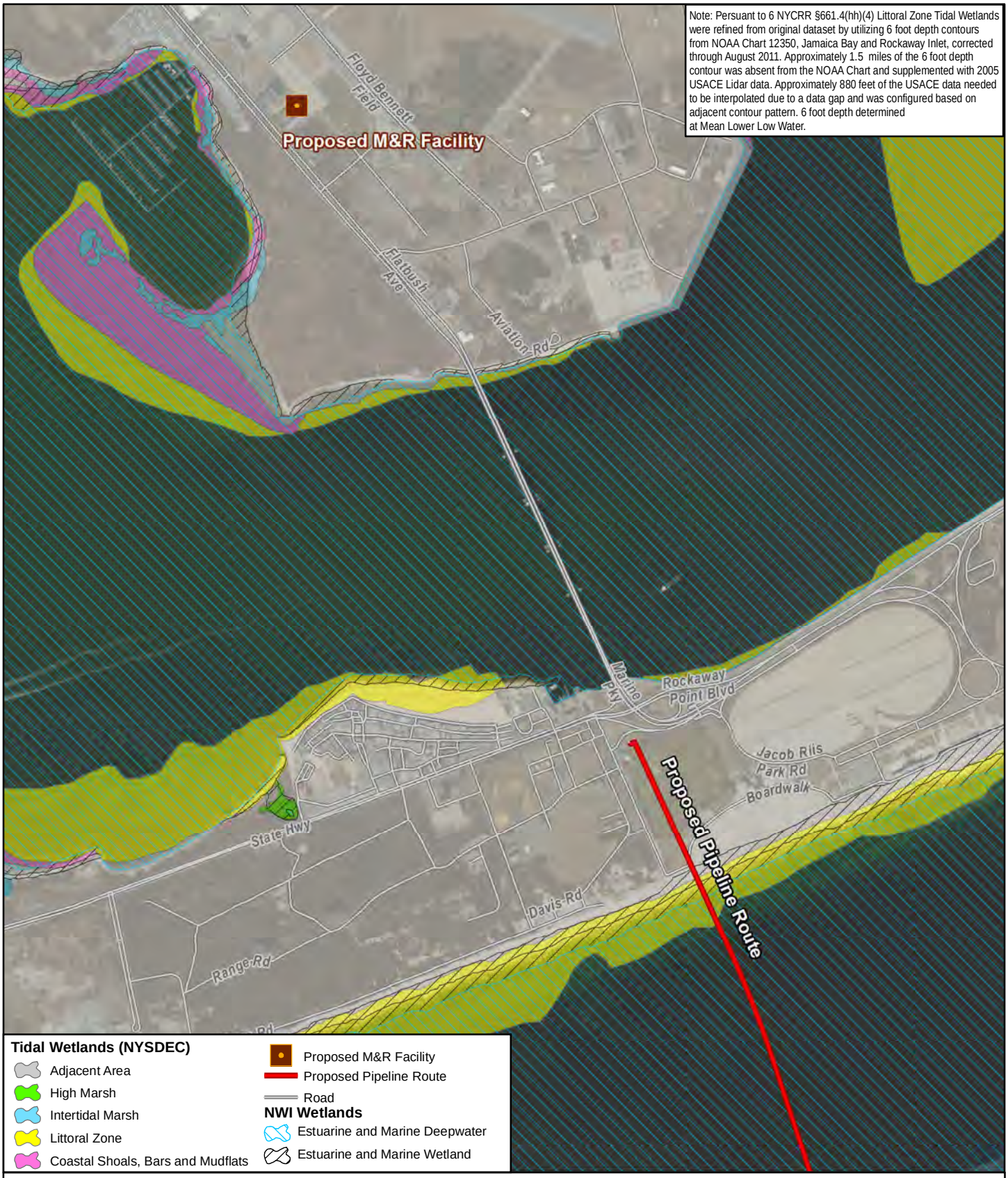

Figure 4.3.3-1
Rockaway Delivery Lateral
and Northeast Connector Projects
Wetlands in the Vicinity of the Rockaway Project

4.4 VEGETATION

4.4.1 Vegetation Resources

The facilities proposed for the Projects are located in marine and terrestrial habitats with varying levels of diversity in vegetation communities. Offshore vegetation along the route of the Rockaway Delivery Lateral was assessed via a remotely operated vehicle (ROV) video investigation. The results showed that the benthic environment in the study area primarily consists of bare sandy bottoms generally lacking aquatic vegetation. Patches of turf algae were identified on manmade, hard-bottom structures, such as concrete and pipe fragments, on the seafloor. Onshore vegetation in the Rockaway Project area and at Compressor Station 195 was assessed via field reconnaissance and desktop review. Three distinct vegetation communities were identified: maritime beach, scrub/shrubland, and developed land. Each of these types is described below.

4.4.1.1 Maritime Beach

The shoreline on the south side of the Rockaway Peninsula is not vegetated, but the area away from the beaches can support a diverse community of annual and biennial species, commonly referred to as the North Atlantic Upper Ocean Beach community. Typical species associated with the community include sea rockets, seabeach saltwort, seaside sandmat, sea sandwort, redroot amaranth, lambsquarters, American burnweed, rough cocklebur, crested saltbush, seabeach amaranth, and seabeach knotweed. Seabeach amaranth is federally listed as a threatened species and seabeach knotweed is state listed in New York as a rare species. Potential impacts on these two species are addressed in Sections 4.7.1.6 and 4.7.5.1, respectively.

4.4.1.2 Scrub/Shrubland

A tall scrub/shrubland community, currently overgrown with vines, is located south of the proposed M&R facility and associated workspace at Floyd Bennett Field. Bordering the scrub/shrubland community is a shorter herbaceous layer. Transco conducted a qualitative assessment of physical landscape characteristics in this area based on an on-site review and aerial photography and determined that this area is similar in composition to northern tall maritime shrublands. This community consists of a diverse mix of native and invasive vines, shrubs, and trees, including deciduous and evergreen species. The dominant vines include Asian bittersweet, Virginia creeper, and eastern poison ivy. The dominant shrub species include northern bayberry in combination with flameleaf sumac and early successional growth stages of black cherry. Many tree species have been noted to occur with later successional stages of black cherry, but not in high abundance.

Due to its proximity to the Atlantic coast and Jamaica Bay complex, the scrub/shrubland community in the vicinity of the Rockaway Project could serve as an important stopover habitat for migratory birds. See Section 4.5.2 for a discussion of migratory birds and other wildlife species.

4.4.1.3 Developed Land

Two Rockaway Project areas occur within developed or maintained land. The first is the 0.7-acre temporary workspace for the HDD entry site within the TBTA property near Jacob Riis Park. This area is covered by short herbaceous species that are regularly disturbed by ground maintenance crews. The vegetation cover is dominated by clover, narrowleaf plantain, and grasses typically found on open, disturbed, Mid-Atlantic coastal uplands. About 0.05 acre of short trees and tall shrubs also occur in this area. Transco does not plan to clear any of this woody vegetation.

The second developed area occurs in the vicinity of the hangar complex at Floyd Bennett Field. Transco conducted surveys within 100 feet of the hangars in September 2012. While most of the area

surrounding the hangars is paved, about 15 percent is covered by herbaceous vegetation consisting mainly of small, ground creeping species such as crabgrass, camphorweed, English plantain, silver cinquefoil, spotted spurge, and carpetweed. Taller vegetation representing more woody species is primarily limited to the fence line between Floyd Bennett Field and Flatbush Avenue. The species inventoried in this area included autumn olive, winged sumac, Japanese honeysuckle, and Virginia creeper.

Compressor Station 195 encompasses about 25.2 acres of developed/maintained land, including areas covered by existing buildings, crushed stone, gravel, and mowed grass. The site also contains trees within hedgerows along the station boundary, the existing access road into the site, and the fence surrounding the existing buildings within the station yard.

4.4.2 Vegetation Communities of Special Concern

According to the NYSDEC, one ecological community of concern, low salt marsh, is located in the vicinity of the Rockaway Project. This community, which is prevalent in Jamaica Bay, is dominated by smooth cordgrass subject to regular tidal inundation. The health of the community has been compromised by development in the surrounding landscape, including construction and use of John F. Kennedy Airport, solid waste landfills, and dredge spoil islands. The nearest low salt marsh community to the Rockaway Project area is located approximately 1.4 miles to the west-southwest. Because of this distance, we do not anticipate any adverse effects on the low salt marsh community or any associated hydrological connections during construction. No vegetation communities of special concern are present at Compressor Station 195, which consists of developed/maintained land.

4.4.3 Invasive Species

Invasive species grow and spread rapidly becoming established over large areas (USDA, 2010a). Typically, they are exotic species introduced from other parts of the United States, another region, or another continent. Invasive plant species can change or degrade natural communities, which can reduce the quality of habitat for wildlife and native plant species.

Removal of existing vegetation and disturbance of soils during construction of the proposed facilities could create conditions conducive to the establishment of invasive plants from adjacent areas. Transco's Plan for the Rockaway Project (see Appendix D) includes provisions for removal and proper disposal of invasive species. Transco would reseed and restore the disturbed soils at the HDD entry location and at Compressor Station 195 following construction activities at these sites. This would promote the establishment of desirable species and deter invasive species from colonizing these areas.

4.4.4 Vegetation Impacts and Mitigation

Offshore activities associated with construction of the Rockaway Delivery Lateral could impact small amounts of turf algae if man-made structures are moved or buried during trenching operations or as a result of vessel anchoring. These effects would be minor and short-lived because the sandy sediments disturbed by construction would settle quickly, and the sediment accumulations caused by trenching would be minor.

The maintained area at the HDD entry workspace on the TBTA property is the primary place where terrestrial vegetation would be affected by construction of the Rockaway Delivery Lateral. Depending on the timing of the restoration of National Grid's BQI Project and start of construction for the Rockaway Project, this area may or may not be fully vegetated when Transco's proposed HDD would occur. Assuming it is vegetated, Transco would temporarily disturb about 0.7 acre of grass in this area. An additional 0.7 acre of vegetation within the GNRA, mostly on the golf course but also on the maritime beach, could potentially be disturbed by foot traffic to monitor the drill path for inadvertent releases of drilling fluid. As discussed in Section 4.7.1.5, we received a comment from the NPS that staff from the

Natural Resource Management Division at the GNRA should accompany Transco during pedestrian monitoring of the drill path to ensure that impacts on sensitive species, including plants such as seabeach amaranth and seabeach knotweed, are avoided. Therefore, we are recommending in Section 4.7.1.5 that Transco consult with the NPS to identify a protocol for coordinated monitoring of the drill path in the GNRA to avoid impacts on sensitive species, including plants.

Based on an assumed cover of 15 percent, construction of the M&R facility for the Rockaway Project would disturb approximately 1.9 acres of herbaceous vegetation growing on, in, and around the pavement surrounding the hangar complex at Floyd Bennett Field. No scrub/shrubland in the vicinity of the M&R facility would be directly affected by the Rockaway Project. It is possible that some scrub/shrubland or additional herbaceous vegetation could be affected by stormwater runoff or an accidental spill, but the potential for this is low. Transco would implement the measures in its Plan and Procedures to limit the effect of stormwater runoff (see Appendices D and E), and the measures in its SPCC Plan and Construction Spill Plans to minimize the potential for and effects of an accidental spill (see Appendices F and G). Following construction, the disturbed soils at the HDD entry location would be reseeded with grasses suitable to the area using a seed mix approved by the TBTA. The existing grasses growing up through the broken pavement surrounding the hangars would be paved over and eliminated.

Construction activities at Compressor Station 195 would disturb up to about 25.2 acres of developed/maintained land, and would require the removal of approximately 25 to 27 trees within hedgerows at the site. Transco would implement the measures in the FERC Plan and its Construction Spill Plan (see Appendix G) to minimize impacts on vegetation at the site. Following installation of the new facilities, the disturbed areas at Compressor Station 195 that do not include new permanent facilities would be restored and reseeded using an appropriate seed mix.

4.4.5 Operations Impacts

We do not anticipate any offshore or onshore vegetation impacts due to operation and maintenance of the Projects. Offshore operations would be limited to the periodic pigging of the pipeline once every 7 years. Transco would disturb less than an acre of the seabed covering the subsea manifold each time this pigging occurs. This is unlikely to impact offshore vegetation due to the sparse distribution of turf algae in the vicinity of the pipeline route.

Transco is not planning to manage any vegetation on the onshore right-of-way for the Rockaway Project. Vegetation at the onshore HDD entry site would be managed by National Grid as part of the BQI Project. The area around the M&R facility would be paved and/or graveled and would not require vegetation maintenance, though the NPS referred to areas around the perimeter of the site that may need reseeding based on existing conditions. Vegetation at Compressor Station 195 would be maintained in accordance with the FERC Plan by Transco's operations department.

We received a comment from the NPS regarding the potential for operational emissions from the M&R facility to affect adjacent vegetation communities. The operational emissions from this facility would be minor and are not expected to affect adjacent vegetation communities. Operational emissions are discussed in Section 4.11.1, which concluded that there would be no significant impact on air quality as a result of the Rockaway Project.

4.5 WILDLIFE AND AQUATIC RESOURCES

4.5.1 Wildlife Resources

The Rockaway Project area includes both offshore and onshore wildlife habitats which broadly can be characterized as the New York Bight, Breezy Point (including beaches and dunes within the GNRA), and Floyd Bennett Field. The New York Bight contains approximately 31,276 square miles, of which 67 percent consists of marine/estuarine waters. The Bight includes open waters, offshore sandy bottoms, and artificial hard-bottom reef structures. These areas support a diverse wildlife community consisting of invertebrates (114 species), birds (232), reptiles and amphibians (31), mammals (38), and fish (99). Many of these have special status, such as federally or state-listed threatened or endangered species, migratory birds, or marine mammals. Others, including fish and shellfish, have commercial or recreational value.

Breezy Point and areas to the east within the GNRA are located in Queens County, New York at the westernmost end of the Rockaway Peninsula seaward of Jamaica Bay. These areas, which consist of a series of adjacent parcels, some of which are within the GNRA and some of which are owned by private entities, form part of the New York City Atlantic Ocean shoreline. Wildlife habitat on Breezy Point and the surrounding area consists primarily of sparsely vegetated dune areas and sand/marine barrier beaches extending north and east from Rockaway Point, but also includes brackish water wetlands. As a relatively undeveloped barrier beach in Queens County, Breezy Point is a valuable habitat for breeding shorebird species (NYSDOS, 1992b).

Floyd Bennett Field is identified as part of a significant land habitat complex dominated by manmade structures and runways (Dowhan, 1997). Much of the complex, including the area around the hangars proposed for the M&R facility, is paved, but Floyd Bennett Field also includes extensive grassland areas between the runways. These grassland areas have been restored and are maintained by the NPS and New York City Audubon Society as a Grassland Restoration and Management Project area.

The wildlife habitats that would be crossed by or are close to the Rockaway Project include offshore sandy bottoms and artificial hard-bottom reef structures, and onshore maritime beach, scrub/shrub, maintained (e.g., lawn), and artificial surfaces with herbaceous vegetation. A description of the vegetation types in these areas is provided in Section 4.4. Some of the terrestrial and marine wildlife species that live or visit these habitats are listed on Table 4.5.1-1.

Compressor Station 195 is located on developed/maintained lands in York County, Pennsylvania. The site is adjacent to both agricultural and forested tracts, which support species such as squirrel, rabbit, deer, woodcock, waterfowl, raccoon, and opossum.

4.5.1.1 Significant or Sensitive Wildlife Habitats

The proposed Rockaway Delivery Lateral would cross approximately 0.15 mile of onshore and offshore areas that have been identified by the FWS as significant land or water habitat complexes. As shown in Figure 4.5.1-1 these habitats are located along the southern shoreline of the Rockaway Peninsula, which Transco would cross using the HDD method. The M&R facility is also located in an area that the FWS has identified as a significant land habitat complex, but the area that would be affected by construction of this facility is developed and mostly paved. Several other sensitive habitats, including low salt marsh and NYSDOS significant coastal fish and wildlife habitat associated with the western tip of the Rockaway Peninsula and Jamaica Bay are within 1.7 miles of the Rockaway Project area. None of these other sensitive habitats would be crossed or adjacent to proposed work areas. Additionally, no significant or sensitive wildlife habitat areas are located within or in the vicinity of Compressor Station 195.

TABLE 4.5.1-1
List of Wildlife Species Representative of the Region or Observed in the Vicinity of the Rockaway Project

Species

TERRESTRIAL

Birds [a]

American black duck, barn owl, black-crowned night heron, black skimmer, Bonaparte's gull, cattle egret, common tern, glossy ibis, grebes, horned lark, killdeer, least tern, little blue heron, loons, mourning dove, northern gannet, northern harrier, northern mockingbird, peregrine falcon, piping plover, roseate tern, seaside sparrow, short-eared owl, snowy egret, song sparrow, tree swallow, tri-colored heron, yellow-crowned night-heron, red-tailed hawks, coopers hawk, sharp-shinned hawk, American kestrel, northern flicker, woodcock, ring-necked pheasants, brown thrashers, catbirds, common yellowthroats, and white-eyed vireos.

MARINE

Fin Fish [a]

Anchovy, alewife, American shad, Atlantic mackerel, Atlantic menhaden, Atlantic sea herring, Atlantic sturgeon, bluefish, butterfish, red hake, round herring, scup, silver hake/whiting, shortnose sturgeon, spiny dogfish, striped bass, summer flounder, tautog, weakfish, winter flounder, and witch flounder.

Shellfish

American lobster, blue crab, green crab, horseshoe crab [b], lady crab, long-finned squid, spider crab, rock crab, red crab, and surfclams.

Benthic Organisms

Soft-bottom community

Atlantic surfclam, Amphipods, Gastropod, hermit crab, Polychaetes, and starfish.

Hard-bottom community

Ascidians, cnidarians, gastropod, northern star coral, Porifera, and sea stars.

Marine Turtles [a]

Green, Kemp's ridley, leatherback, and loggerhead.

Marine Mammals [a]

Pinnipeds

Gray seal, harbor seal, and harp seal.

Cetaceans

Atlantic white-sided dolphin, bottlenose dolphin, short-beaked common dolphin, harbor porpoise, long-finned pilot whale, short-finned pilot whale, minke whale, right whale, humpback whale, and fin whale.

Ichthyoplankton

Egg and/or larval essential fish habitat for butterfish, cobia, king mackerel, monkfish, red hake, scup, silver hake, Spanish mackerel, summer flounder, winter flounder, windowpane flounder, and several shark species.

Zooplankton

Copepods: *Calanus finmarchicus*, *Centropages finmarchicus, Centropages typicus,* gastropod larvae *(undefined sp.), Limacina retroversa, Oithona similis, Pseudocalanus sp.,* pteropod larvae *(undefined sp.),* and *Temora longicornis.*

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Sources: Cetacean and Turtle Assessment Program, 1982; Ecology and Environment, 2009; Ecology and Environment, 2011; Judkins et al., 1979; Kaneta et al., 1985; McGowan and Corwin, 2008; McKown, 2009; National Oceanic and Atmospheric Administration, National Marine Fisheries Service, 2012a; New York Times, 2012; Riverhead Foundation for Marine Research and Preservation, 2010; Smith et al., 1979; Thompson and Härkönen, 2008; Waring et al., 2012.

[a] Among other species, this list includes federally protected marine mammals and federally listed and state-listed threatened and endangered species that potentially occur in the vicinity of the Rockaway Project area. Federally protected marine mammals are discussed in Section 4.5.2.2 and in Transco's application for an Incidental Harassment Authorization under the Marine Mammal Protection Act, which is provided as Appendix N. Federally listed and state-listed threatened and endangered species are discussed in Section 4.7.

[b] Horseshoe crab is actually an arthropod.

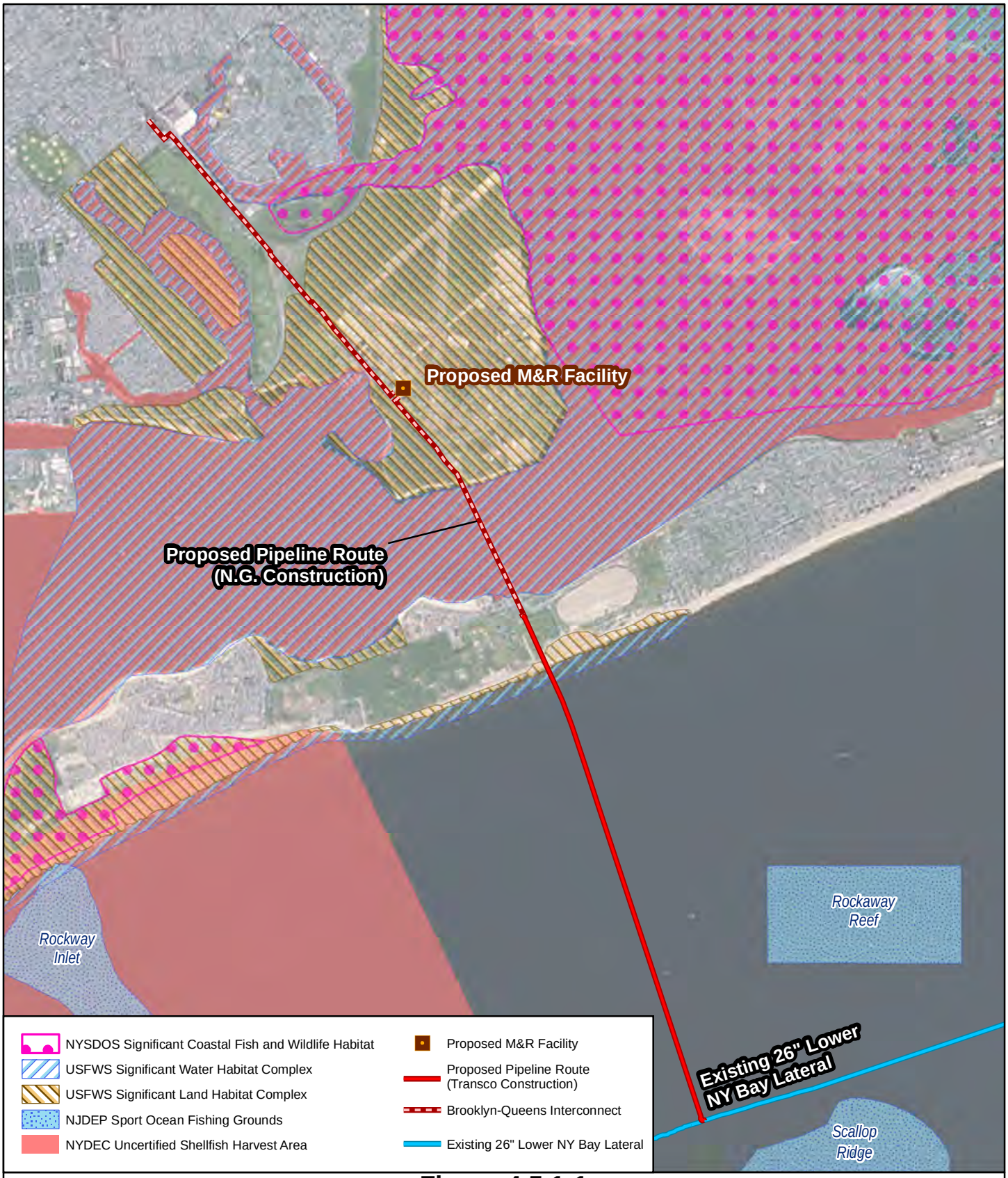

Figure 4.5.1-1
Rockaway Delivery Lateral
and Northeast Connector Projects
Federal and State Significant Habitat Areas
in the Vicinity of the Rockaway Project

4.5.2 Wildlife Construction Impacts and Mitigation

The impact of the Projects on wildlife and their habitats would vary depending on the life history of each species and the habitats present in construction areas. During construction, more mobile species would temporarily be displaced from the construction right-of-way and surrounding areas to similar nearby habitat. Some displaced wildlife would return to the newly disturbed areas and adjacent, undisturbed habitats after completion of construction. Less mobile species, such as benthic organisms along and near the offshore segment of the Rockaway Delivery Lateral, may experience direct mortality or permanent displacement (see Section 4.6.3).

4.5.2.1 Marine Wildlife Impacts

Construction of the offshore portion of the proposed Rockaway Delivery Lateral would have impacts on marine wildlife similar to those described for fisheries and other aquatic organisms in Sections 4.6.2 and 4.6.3 and for threatened and endangered marine species in Section 4.7.1. The activities most likely to affect marine wildlife include offshore excavation, vessel anchoring, pile driving, the HDD operation, accidental spills of construction-related fluids (e.g., oil, gasoline, or hydraulic fluids), withdrawal and discharge of hydrostatic test water, and construction-related vessel traffic. A brief summary of the impacts associated with these activities is provided below. Additional details about the potential effects of these activities and on Transco's proposals to minimize or avoid effects are described in Sections 4.6.2, 4.6.3, and 4.7.1.

Offshore Excavation, Anchoring, and Backfilling

Offshore excavation would be conducted using a clamshell dredge, a jet sled, and hand-jetting equipment. Backfill would be conducted, as necessary, by using a suction dredge, hand jets, or a clamshell dredge (see Section 2.3). The duration of these activities would be short term, including approximately 10 days for dredging of the HDD exit pit, 8 days for jetting the offshore trench, 2 to 4 days for each hand-jetting activity, and 15 days for backfilling, as necessary. Support vessels associated with these activities would include a lay barge using an eight-point mooring system of wire ropes and anchors affixed with mid-line buoys, a dive support vessel that would position itself with a three- or four-anchor system affixed with mid-line buoys, and the jack-up barge that would be positioned using lift legs that press against the seafloor. In the vicinity of the construction area, aquatic species could be impacted directly by the excavations, anchoring of vessels, or backfilling, or indirectly by the disturbance of sediments, including the suspension of sediments in the water column and the re-deposition of sediments that fall out of suspension onto the seabed.

We received a comment from NOAA Fisheries regarding the configuration of the mid-line buoy systems which would be used on the lay barge and dive support vessel during construction of the Rockaway Project. Specifically, NOAA Fisheries asked if use of the mid-line buoys would result in taught, vertical lines in the water column, which could pose a risk of entanglement to marine species. As shown in Figure 2.3.1-9, the mid-line buoys are expected to be fixed to cables floating in the middle of the water column, as opposed to being suspended at the surface of the water. Based on this configuration, we do not expect that the mid-line buoy systems would create taught, vertical lines in the water column.

Marine benthic organisms that are attached to or rest on sediments (epifauna) or burrow or bore into sediments (infauna) would likely be killed within the area of direct offshore impact (about 29.0 acres) and could be killed or stressed in areas that are covered by fallout of suspended sediments of up to about 1.2 inches (approximately 45.2 acres[8]) (see Figure 4.5.2-1).[9] The impact on benthic organisms has the potential to affect fish and other organisms that prey on benthic species. Marine organisms may also be affected by high levels of turbidity in the water column. These and other potential impacts are assessed in more detail in Section 4.6.3.2. As described in that section, the effects of sedimentation would be temporary and localized.

Transco would configure the discharge nozzles during the third pass of the jet sled to expel sediment behind the sled and into the trench, which would provide for immediate backfill as the pipeline is lowered below the seabed. Additional backfill would be provided by sloughing of the trench sidewalls during jetting and by natural infill as sediments migrate across and settle into the open trench. Following installation of the pipeline, Transco would conduct a hydrographic survey to document seafloor elevations along the pipe trench as well as other offshore excavation areas. Transco would backfill any areas such that the seabed is restored to pre-existing conditions and there is 4 feet of cover over the pipeline and other facilities using native sediments withdrawn from the seabed. Transco would also add a top layer of native sediments over the drilling fluid and cuttings that collect within the offshore HDD exit pit. In addition, we are recommending in Section 4.6.3.2 that Transco file a post-construction hydrographic monitoring plan for the subsea pipeline to ensure that seafloor contours are restored.

Following backfill, we anticipate that disturbed areas would be recolonized by invertebrates within a period of 1 to 2 years based on the results of a number of studies on benthic recovery (e.g., AKRF, Inc., et al., 2012; Germano et al., 1994; Hirsch et al., 1978; Kenny and Rees, 1994 and 1996; LaSalle et al., 1991; Murray and Saffert, 1999; Newell et al., 1998; NOAA Fisheries Northeast Region, 2013b; and Rhoades et al., 1978). This estimate represents what we would expect in areas effected by dredging or trenching as well as adjacent areas where re-deposition of sediments would be thickest. Faster rates of recovery would likely occur in areas less effected by sedimentation. Additional discussion of impacts on benthic species is provided in Section 4.6.3.2.

In considering the size of the offshore impact relative to the area of similar habitat available in the New York Bight, as well as the rate of recovery by the affected species, no significant long-term impacts on benthic species are expected from the excavation activities. Additionally, we are recommending in Section 4.6.3.2 that Transco file a post-construction benthic sampling and monitoring plan for the subsea pipeline to ensure that benthic communities recover as expected.

[8] This is an estimate of the area where average trenching-induced sedimentation in the ECOM model cells could exceed 1.2 inches (3 cm) in thickness, including areas of overlap subject to sediment deposition from different offshore construction activities. See Section 4.6.3.2 for a discussion regarding impacts on coral due to sedimentation.

[9] In Figure 4.5.2-1, the sonar targets are areas of hard-bottom deposition documented by Transco as a result of its marine surveys. The targets consist of features such as rock and concrete rubble, steel or concrete pipes, cables, rebar, and construction debris. Impacts on species such as coral, which may inhabit hard-bottom areas, are discussed in Section 4.6.3. The purple line on the figure identified as the "Atlantic Sturgeon aggregation depth" represents a sturgeon aggregation area documented by the NYSDEC around the 33-foot depth contour between the Rockaway and East Rockaway inlet (Laney et al., 2007). Impacts on Atlantic sturgeon are discussed in Section 4.7.1.2.

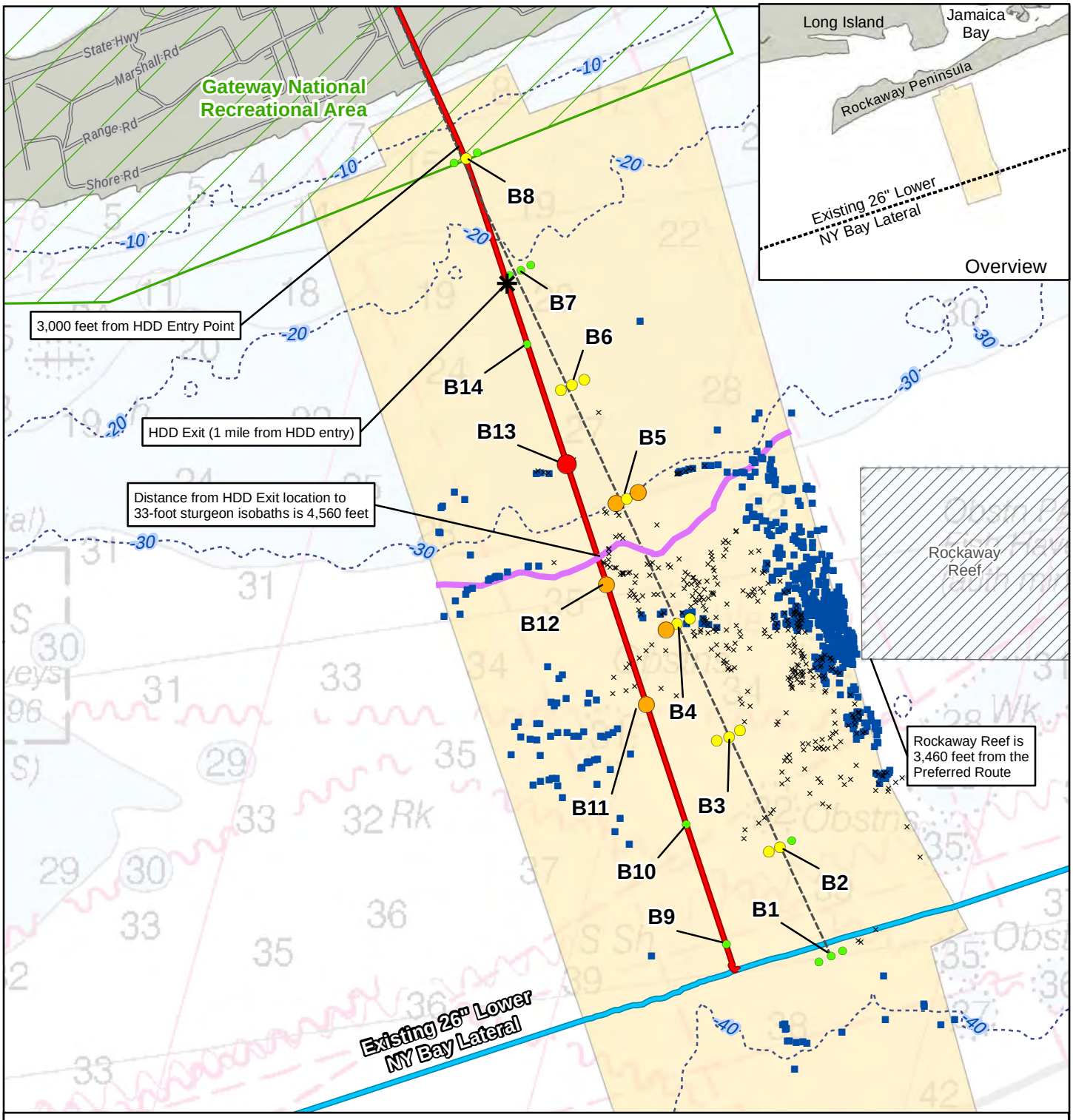

Figure 4.5.2-1
Rockaway Delivery Lateral and Northeast Connector Projects
Benthic Resource Survey
for the Rockaway Delivery Lateral

Pile Driving

As described in Section 2.3, 10 temporary goal posts and 60 temporary fender piles would be installed offshore near the HDD exit pit using a vibratory hammer (see Figure 2.3.1.7). The noise associated with the installation of these piles has the potential to affect marine wildlife, including fish, turtles, and marine mammals. Estimates of the potential noise levels that would be generated by the vibratory hammer and the acoustic injury and behavioral disturbance thresholds for fish, sea turtles, and marine mammals are presented in Table 4.5.2-1. The table also identifies whether the predicted noise of pile driving would exceed any of the thresholds and, if so, the distance from the pile driving activity that would be subjected to noise in excess of the threshold.

A key assumption in developing the data presented in Table 4.5.2-1 was the estimate of noise that would be generated by operation of the vibratory hammer. Transco estimated this value using data from a study by ICF Jones & Stokes and Illingworth and Rodkin, Inc. (2009). This report provides measured values for the installation of various diameter steel piles using either impact or vibratory hammers. No data was provided in the study for the pile sizes Transco proposes to use during construction of the Rockaway Delivery Lateral (i.e., 14- to 16-inch diameter). As a result, Transco compared measured noise values for the installation of 12- and 36-inch-diameter steel piles in 5 meters (16.4 feet) of water using a vibratory hammer. The difference in the measured values between the 12- and the 36-inch-diameter piles was 20 dB (values of 155 dB RMS for 12-inch piles and 175 dB RMS for 36-inch piles). Based on these data, Transco added 5 dB RMS to the measured values for 12-inch-diameter piles to estimate noise for the installation of 14- to 16-inch piles using a vibratory hammer.

Transco's analysis indicates that the noise from pile driving would not exceed the injury thresholds for cetaceans, pinnipeds, and sea turtles at any distance from a pile driving activity. The noise would exceed the injury threshold for fish within a relatively short distance from the pile driving activity (i.e., within a distance of 7.1 feet for fish weighing 2 grams or more and a distance of 13.1 feet for fish weighing less than 2 grams). The analysis suggests that both sea turtle and fish behavior could be disturbed by the pile driving at distances of 13.1 feet and 151 feet, respectively, from the pile (see Sections 4.6.3.2 and 4.7.1.3). As discussed in more detail below, the area encompassed by the behavioral disturbance threshold for marine mammals (cetaceans and pinnipeds) is more expansive.

We received a comment from NOAA Fisheries that a different piece of equipment should be used to estimate noise impacts for the installation of 14- and 16-inch-diameter piles, which would result in higher noise values. Specifically, NOAA Fisheries suggested that the noise estimate should be based on measured values for the installation of 14-inch-diameter steel piles using an impact hammer, minus a value of 10 dB RMS to account for the expected decrease in noise due to installation with a vibratory hammer. The resulting estimate of noise using this methodology would be higher than the value used by Transco and would result in higher noise estimates than presented in Table 4.5.2-1. Higher noise estimates would result in an increase in the area where aquatic species could be affected by noise during pile driving activities.

Based on our review of available data, we conclude that use of either methodology to estimate noise is based upon a set of assumptions. Transco's estimate is based on the use of a vibratory hammer but extrapolates noise levels for a pile diameter that was not studied. The NOAA Fisheries' methodology is based on the use of the pile diameter proposed by Transco, but uses a different piece of equipment than that proposed (impact hammer). We believe that overall, the installation tool is likely to have a bigger influence on acoustic impacts than the pile diameter.

TABLE 4.5.2-1
Calculated In-Water Noise Zones Based on Expected Pile Driving Levels Average Sound Pressure for the Rockaway Delivery Lateral

Functional Hearing Group	Reference Injury Threshold	Reference Behavioral Disturbance Threshold	Pile Diameter	Source Pile Driving Levels [a, b]			Distance Where Noise Exceeds the Reference Injury Threshold [f]	Distance Where Noise Exceeds the Reference Behavioral Disturbance Threshold [f]
				Peak (dB re 1 µPa) [c]	RMS (dB re 1 µPa RMS) [d]	CSEL (dB re 1 µPa2-sec) [e]		
Cetaceans	180 dB RMS [h]	120 dB RMS [h]	14- to 16-inch	191	175	192	No impact	2.86 miles
Pinnipeds	190 dB RMS [h]	120 dB RMS [h]	14- to 16-inch	191	175	192	No impact	2.86 miles
Sea Turtle	207 dB RMS [i]	166 dB RMS [j]	14- to 16-inch	191	175	192	No impact	13.1 feet
Fish (≥ 2 grams)	206 dB Peak *and* 187 dB CSEL [k]	150 dB RMS [k]	14- to 16-inch	191	175	192	7.1 feet	151 feet
Fish (<2 grams)	206 dB Peak *and* 183 dB CSEL [k]	150 dB RMS [k]	14- to 16-inch	191	175	192	13.1 feet	151 feet

[a] These values represent un-attenuated pile driving sound levels at a distance of 3.3 feet from the pile for in-water installation at a depth of approximately 30 feet using a vibratory hammer.

[b] Transco used a study by ICF Jones & Stokes and Illingworth and Rodkin, Inc. (2009) for near source sound levels for the installation of twelve-inch-diameter piles with a vibratory hammer in 5 meters (16.4 feet) of water. This study identified sound levels at a distance of 33 feet from the pile. For the Rockaway Project, Transco estimated near source sound levels for the installation of 14- to 16-inch piles (i.e., sound levels occurring at a distance of 33 feet from the pile) by adding 5 dB to account for the increase in the diameter of the pile and an increase in the depth of the installation to approximately 30 feet of water. We calculated the sound levels at a distance of 3.3 feet from the pile using the data provided by Transco and the following calculation for sound in shallow underwater environments: TL = B Log (R_1/R_o), where TL = Transmission Loss in dB, B = the geometric spreading constant, R_1 = the distance to the sound level estimate, and R_o = the distance of the known sound level.

[c] Peak sound level is the maximum absolute value of the instantaneous sound pressure.

[d] Root mean square (RMS) is the square root of a squared time domain signal and the mean pressure.

[e] For a continuous noise source, such as a vibratory hammer, cumulative sound exposure level (CSEL) is a measure of cumulative energy occurring over the vibratory period. In calculating the CSEL, we assumed a vibratory period of 60 seconds, which is the time required to drive a pile to a depth of approximately 25 to 30 feet below the seabed.

[f] The value represents the approximate distance from a pile where sound would exceed the reference injury threshold. "No impact" indicates that that sound from pile driving would not exceed the reference injury threshold.

[g] The value represents the approximate distance from a pile where sound would exceed the reference behavioral disturbance threshold. "No impact" indicates that that sound from pile driving would not exceed the reference behavioral disturbance threshold.

[h] Current NOAA Fisheries Marine Mammal Protection Act injury and harassment thresholds.

[i] Based on Young, 1991; Keevin and Hempen, 1997; Ross, 1987; Stadler and Woodberry, 2009; and SVT Engineering Consultants, 2010.

[j] Based on McCauley, et al. 2000. See also Palmer, 2012.

[k] Dual sound criteria for injury established by the Fisheries Hydroacoustic Working Group, 2008. Behavioral thresholds are based on Anderson et al., 2007; Purser and Radford, 2011; and Wysocki et al., 2007. See also Palmer, 2012.

Noise generated by pile driving can also vary depending on factors such as water depth and substrate. A study by ICF Jones & Stokes and Illingworth and Rodkin, Inc. (2009), for example, identifies different measured values for noise resulting from the installation of similar diameter piles in similar depths of water using the same type of equipment. We believe the methodology used by Transco to estimate noise impacts due to pile driving activities is reasonable, but we recognize that the actual noise levels could differ from the predicted noise due to a number of factors. For these reasons, and to ensure that the actual noise of pile installation and removal is consistent with the predicted values, **we recommend that:**

- **Prior to construction of the offshore portion of the Rockaway Delivery Lateral, Transco should file with the Secretary for review and written approval by the Director of OEP a noise monitoring and mitigation plan. The plan should include:**

  a. a description of the equipment and methods Transco would use to measure noise during installation of the 14- and 16-inch-diameter piles;

  b. a figure illustrating where the measurement equipment would be placed relative to the piles;

  c. provisions for reporting noise data to the FERC and NOAA Fisheries;

  d. mitigation measures that would be implemented to reduce noise to acceptable levels if the noise exceeds predicted values (e.g., use of bubble curtains, isolation casings, or cushion blocks, or seasonal restrictions); and

  e. comments on the plan from NOAA Fisheries.

Horizontal Directional Drilling

Transco selected the HDD construction method for a portion of the offshore pipeline segment to avoid impacting sensitive near-shore areas including the beach and significant habitats on the Rockaway Peninsula. Following excavation of the offshore exit pit and installation of piles, the HDD pilot hole would be drilled and then enlarged from an onshore entry point to the exit pit (see Section 2.3 for a more detailed discussion of HDD operations). The greatest potential impact of the HDD would be the release (planned or unplanned) of drilling fluid into the marine environment.

Transco anticipates that approximately 12,000 to 15,000 cubic yards of drilling fluid mixed with cuttings would be released into the water at the offshore HDD exit location. This material would collect within the pit excavated at the exit site. Based on the cohesive properties of the drilling fluid in saltwater, the material is expected to remain stable at the bottom of the exit pit and not escape into the surrounding area.[10] We also note that the discharge would be subject to requirements identified in applicable standards and permits, such as the New York State water quality standards and the NYSDEC's water quality certificate, including any requirements associated with discharge of additives in the drilling fluid.

To minimize the potential for toxic impacts on marine wildlife, Transco proposes to use a water-based drilling fluid with non-toxic additives as opposed to oil-based or synthetic-based mud systems that

[10] Bentonite in the drilling fluid is expected to settle at the bottom of the HDD exit pit due to particle aggregation (flocculation) as the drilling fluid enters the marine environment (Berner and Berner, 1996; Middleton and Southard, 1977; A.H. Glenn, 2011; and Akther et al., 2008). Transco stated that no elevated turbidity readings were observed within the water column when managing drilling fluid discharged to an offshore HDD exit pit during construction of the Gulfstream Pipeline in Tampa Bay, Florida.

have been shown to have higher chronic toxicity effects (Cranford et al., 2001). The combined initial concentrations of bentonite and other additives would likely remain below 10 percent of the total volume of the drilling fluid. At this concentration, the drilling fluid is not expected to cause acutely toxic conditions for benthic fauna (see Section 4.6.3.2 for additional discussion of the ecotoxicity of drilling fluid).

Inadvertent releases of drilling fluid outside of the HDD exit pit either offshore or onshore are possible but not expected. Transco would monitor the HDD operation for inadvertent releases. The proposed monitoring would include checking the pressure and volume of drilling fluid returns to look for a rapid increase in pressure or a loss of returns, which may indicate either a blockage or release. Transco would conduct visual inspections of the ground surface between the HDD entry hole and the shoreline at least twice a day to look for evidence of a release.

Transco would stop the drilling activity if the volume of inadvertent releases of drilling fluid creates a threat to public health and safety or if an inspection/evaluation is needed to determine if mitigation measures, including the use of additional additives, are necessary to maintain the integrity of the drill hole. In the latter case, any suspension of drilling activity would be temporary and short term. Transco has prepared an HDD Monitoring and Contingency Plan (Appendix H) for the Rockaway Project, which describes the measures that Transco would implement to prevent and identify inadvertent releases of drilling fluid and to clean-up inadvertent releases that occur onshore.

Transco has not identified any formal monitoring procedures for the area between the shore and the exit pit, but stated that inspection personnel on the vessels beyond the exit pit would visually inspect the areas at least twice daily. If an inadvertent release is detected offshore, outside of the HDD exit pit, Transco stated it would document the release, determine the cause of the release, and then implement measures to control the release and minimize the chance of reoccurrence. Corrective measures would be identified by Transco and its drilling contractor based on site-specific conditions at the time of the release.

In comments on the draft EIS, both the USACE and NOAA Fisheries recommended that Transco prepare a response plan for offshore inadvertent releases that occur outside the HDD exit pit. Therefore, we have included a recommendation in Section 4.3.2.3 that Transco file an updated HDD Monitoring and Contingency Plan that includes response procedures for offshore inadvertent releases of drilling fluids.

Hydrostatic Test Water Withdrawal and Discharge

During the hydrostatic testing process, approximately 573,500 gallons of seawater (over three testing events) would be withdrawn from the marine environment. The seawater would be withdrawn at a fill rate of approximately 4,000 gallons per minute filtered through a 200-size mesh screen (i.e., with a mesh opening of 0.0029 inch or 0.07 millimeter). For each test, the water in the pipeline would be treated with an oxygen scavenger and a biocide to prevent corrosion of the pipeline, and a non-toxic dye to help detect potential leaks (see Section 4.6.3.2 for an assessment of the ecotoxicity of these additives). Once each test is completed, the hydrostatic test water would be discharged in the same general area from which it was withdrawn. Both the additives in the water and the physical process of withdrawing and discharging the water could impact marine life.

During the process of withdrawing water from the marine environment, organisms that can physically fit through the mesh on the intake screen could become trapped (entrained) in the pipeline, and larger organisms could be impinged on the screen. Entrained and impinged organisms would likely perish. In addition, marine organisms could be harmed if exposed to high concentrations of the oxygen scavenger and biocide that would be added to the test water to prevent corrosion. As described more fully in Section 4.6.3.2, neither of these effects is expected to be significant. The proposed water withdrawals would be temporary and a comparatively small amount of water would be used. Transco would use a multi-port diffuser during discharge to re-oxygenate the water and disperse (dilute) the concentrations

of the scavenger and biocide as they are released to the marine environment. We also note that the discharges would be subject to requirements identified in applicable standards and permits, such as the New York State water quality standards and the NYSDEC's water quality certificate, including any requirements associated with discharge of the scavenger, biocide, and dye.

Spills and Operational Waste

Marine life could be affected by a spill of hazardous materials or by ingesting or becoming entangled in trash and debris. All offshore vessels would be expected to comply with USCG requirements for the prevention and control of oil and fuel spills (MARPOL, Annex V, Pub. L. 100−220 [101 Stat. 1458]), and would be required to register for the EPA NPDES Vessel General Permit, which includes measures to protect against impacts associated with discharges incidental to the operations of commercial vessels. Transco would also adhere to the USCG marine trash policy. These measures would protect marine life from the potential for and impacts of trash, debris, and hazardous spills.

Transco stated in its SPCC Plan for the Rockaway Project (see Appendix F) that emergency response procedures for offshore spills would be identified after the construction contractor has been selected. We have added a recommendation in Section 4.3.2.3 that Transco file an updated SPCC Plan that includes specific measures to be implemented to identify, control, and clean up any accidental leaks or spills from offshore construction vessels.

Vessel Activity and Noise

Potential impacts associated with vessel activities would include the possibility of vessels striking fish, turtles, or marine mammals, and noise associated with the operation of the vessels. In general, the potential for vessel strikes is low due to the limited offshore traffic and the depth of water in the offshore construction area (about 20 to 40 feet). The crew and escort boats would make daily trips between the shore and the offshore construction site. The pipe transport barges (and the four tug boats that support them) would travel between the pipe yard and the offshore construction site once per day during pipe laying activities, where one barge would be loaded at the pipe yard while the other would be used at the offshore worksite. The dive support vessel could make daily trips to and from the work area if it docks in the harbor at night, but the vessel would be capable of anchoring in the work area overnight. The fuel barge (and the tug boat that supports it) would make about one trip per week to the work area to refuel vessels and equipment. The other vessels, including the clamshell barge, jack-up barge, and pipe lay barge (and associated tug boats) would remain at the offshore construction area for the duration of their work. While on-site, construction vessels would not be running and would either be anchored, lifted above the water, or moved by their tug boats. This would minimize the potential for vessel strikes.

The underwater noise associated with vessels is attributed to low-frequency sounds created by the reverberation of engines and their propellers. Because propeller use by the larger vessels on the Rockaway Project would be limited, the noise impacts from these vessels are expected to be comparable to those generated by existing heavy vessel traffic in the area. The Rockaway Delivery Lateral is located in the precautionary area of the shipping lanes in the Port of New York and New Jersey. This is the largest port on the U.S. east coast and third largest port in the United States (DOT MARAD, 2011). Based on the proximity of the Rockaway Delivery Lateral to this major shipping center, the background noise is likely dominated by large vessels (e.g., container ships) that produce source levels of 180 to 190 decibels (dB) re 1 micropascal (µPa) root mean squared (RMS) at frequencies between 200 and 500 hertz (Hz) (Thomsen et al., 2009; Jasney et al., 2005). Therefore, the background noise in the underwater environment is likely similar to the noise that would be generated by the largest vessels that would be used during construction of the Rockaway Delivery Lateral. As such, we do not expect that the small number of vessels associated with the Rockaway Project would have any significant effect on the existing underwater noise environment or on the marine species inhabiting the waters in the vicinity of the Rockaway Delivery Lateral during construction.

We received a comment from NOAA Fisheries regarding our assessment of potential impacts on marine species due to underwater noise associated with vessel operations relative to noise associated with piling driving activities. Vessel noise and pile driving activities both produce low frequency sounds. Our analysis of impacts assumes that vessel noise would be similar to existing conditions in the construction area but noise due to pile driving would be atypical. While ambient sound levels in the Rockaway Project area are unknown, we assumed that vessel noise due to construction would be consistent with vessel noise associated with the transit of large commercial vessels into and out of the Port of New Jersey and New York. Marine species in the area are likely accustomed to noise associated with transiting vessels due to existing heavy traffic into and out of the port. For this reason, we assumed that noise from the operation of construction vessels would not be discernable from noise due to existing vessel traffic by marine species.

Because it is a low frequency sound, noise from the vibratory hammer could be consistent with existing ambient conditions in the construction area. However, we determined that noise impacts from operation of the vibratory hammer should be assessed because it represents an atypical noise source in the construction area and thus may be perceived differently by marine species. We consider this a conservative approach in assessing noise impacts.

4.5.2.2 Marine Mammal Impacts

There is no specific marine mammal foraging habitat in the vicinity of the Rockaway Delivery Lateral, but up to 13 species of marine mammals are transients that use the Atlantic Ocean south of Long Island during the year. We have determined that at least six of these species (Atlantic white-sided dolphin, long-finned pilot whale, short-finned pilot whale, minke whale, humpback whale, and fin whale) are highly unlikely to be present in the Rockaway Project area during the proposed offshore construction period. The other seven (gray seal, harbor seal, harp seal, short-beaked common dolphin, bottlenose dolphin, harbor porpoise, and right whale) are more likely to occur in the area during construction.

Marine mammals are federally protected under the MMPA, which prohibits the taking of these species except under certain circumstances. The MMPA includes an incidental take program that provides a process for the taking of small numbers of marine mammals provided that the taking has a negligible impact. The most recent amendment to the MMPA in 1994 established an expedited process by which parties can apply for an authorization, referred to as an IHA, to incidentally take small numbers of marine mammals by harassment. Harassment is defined as any act with the potential to injure a marine mammal (Level A harassment) or disturb a marine mammal by causing disruption of behavioral patterns, including but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment). NOAA Fisheries has the authority to enforce the MMPA and issue IHAs. Transco is consulting with NOAA Fisheries and submitted an application for an IHA for Level B harassment of the seven mammal species with the highest potential to be present in the vicinity of the Rockaway Delivery Lateral during construction. A copy of Transco's IHA, which includes descriptions of the gray seal, harbor seal, harp seal, short-beaked common dolphin, bottlenose dolphin, harbor porpoise, and right whale, is included in Appendix N. A summary of Transco's request for an IHA and our evaluation of the Rockaway Project's potential impacts on marine mammals are presented below.

Marine mammals in the Rockaway Project area could be affected if haul-outs used by seals are disturbed,[12] or if construction activities result in direct or indirect impacts on mammal species. The closest known haul-out sites for seals along the southern coast of Long Island are located approximately 10 miles to the west and 15 miles to the east of the proposed Rockaway Delivery Lateral. Therefore, we have determined that the Rockaway Project would not affect haul-outs used by seals. Project-related construction activities with the potential to affect all marine mammals include underwater noise associated with the operation of vessels or the vibratory hammer; turbidity and water quality impacts

[12] Hauling-out is when seals temporarily leave the water.

associated with jetting, dredging, and HDD activities; water withdrawal and discharge associated with hydrostatic testing; and spills of hazardous materials. We evaluated the effects of vessel noise, spills, hydrostatic testing, and water quality impacts associated with various construction methods on marine wildlife in Section 4.5.2.1. Our analysis regarding these effects would also apply to marine mammals and their prey.

The activity with the greatest potential effect on marine mammals would be the operation of the vibratory hammer, which could generate noise that may not be masked by existing background vessel or ambient noise. Two vibratory hammers would be deployed to the offshore work area; one hammer would be in the process of positioning while the other is actively hammering. The anticipated time for installation of each individual pile would be approximately 1 to 2 seconds per foot of depth driven, with each pile being driven to a depth of approximately 25 to 30 feet below the seafloor. Therefore, it would take about 60 seconds of continuous driving to install each individual pile. Transco estimates that all the piles would be installed over a period of approximately 10 days with about seven piles driven each day. This equates to about 7 minutes per day of operating time for the vibratory hammer. The total operating time of the vibratory hammer for extraction of the piles at the end of the construction period is estimated to be similar to the installation time.

Based on the source levels reported in Table 4.5.2-1, vibratory pile driving would not produce 180 dB re 1 µPa RMS or greater; therefore, it would not result in the potential for injury or physiological impacts on marine mammals, such as temporary threshold shift or permanent threshold shift.[13] Behavioral disturbance levels of sound (i.e., greater than 120 re 1 µPa RMS) could occur within 2.86 miles of the vibratory pile driving activity. We have added a recommended in Section 4.5.2.1 that Transco file a noise monitoring and mitigation plan to ensure that actual noise is consistent with predicted values and/or to reduce noise to acceptable levels.

Behavioral reactions to noise can include a flight response, changes in breathing and diving patterns, avoidance of important habitat or migration areas, and/or a disruption of social relationships and interactions (Richardson et al., 1995; Nowacek et al., 2007; McCauley et al., 2000). Acoustic responses from marine mammals can include masking,[14] changes in call rates, and changes in call frequency (Southall et al., 2007; Richardson et al., 1995; Nowacek et al., 2007). Physiological responses can include increased stress levels (Richardson et al., 1995; Southall et al., 2007; Wright et al., 2007). When or how a marine animal responds to a sound depends on numerous variables such as the characteristics of the sound itself, characteristics of the animal (e.g., age, sex, and habitat), and previous exposure to the sound of concern or other sounds (Wartzok et al., 2004).

As discussed above, Transco would conduct a post-installation hydrographic survey to document seafloor elevations along the pipe trench as well as other offshore excavation areas. The survey would be conducted with a multi-beam echo sounder and high-resolution side-scan sonar, both of which are considered pulsed noise sources. Operating frequencies for this equipment (240 kilohertz or greater for echo sounders and a range of 445 to 900 kilohertz for side-scan sonar) are outside the hearing ranges for the marine mammals that may be present in the project area at the time of construction (BOEM, 2012; ESS Group, Inc., 2011; Gotz et al., 2009). Therefore, the sound associated with the post-installation hydrographic survey would not affect marine mammals.

Recognizing the potential effects of the Rockaway Project, and in particular the noise of the vibratory hammer, Transco estimated for each species the likelihood of a marine mammal being present

[13] Temporary threshold shift is the temporary, fully recoverable reduction in hearing sensitivity due to exposure to greater-than-normal sound intensity. Permanent threshold shift is a permanent, non-recoverable reduction in hearing sensitivity due to damage caused by either a prolonged exposure to a sound or temporary exposure to a very intense sound.

[14] Masking is a decreased ability of an animal to detect relevant sounds due to an increase in background noise that effectively blocks those sounds.

within the expected zone of influence (i.e., the area expected to experience underwater noise exceeding 120 re 1 μPa RMS) during active vibratory pile driving. Transco estimated this number (using the noise data described in Table 4.5.2-1) by multiplying the area encompassing the zone of influence by the estimated density of each animal species in the Rockaway Project area. Transco then used this number to determine the number of takes to request in its IHA for each species. Based on this, Transco has requested the following Level B take authorizations from NOAA Fisheries:

- 14 gray seals;
- 207 harbor seals;
- 4 harp seals
- 1 right whale;
- 67 short-beaked common dolphin;
- 16 bottlenose dolphins; and
- 12 harbor porpoises.

The estimated number of takes requested by Transco in its IHA is based on construction occurring in winter, spring, and summer. However, Transco currently proposes to complete the in-water work associated with the Rockaway Project between April and September. Therefore, we concluded that the actual number of individual marine mammals potentially affected by the Rockaway Project would likely be less than what is requested in Transco's IHA. The estimated number of individuals potentially affected by the spring and summer construction schedule is presented in Table 4.5.2-2 below. Additional consultation with NOAA Fisheries regarding impacts on marine species would be necessary if in-water construction activities continue into the fall.

TABLE 4.5.2-2
Estimated Number of Marine Mammals Potentially Affected by the Rockaway Project

Species	Estimated Density per 38.6 mi^2 Spring	Estimated Density per 38.6 mi^2 Summer	Estimated Number of Individuals Affected [a]	Abundance of Stock	Percentage of Stock Potentially Affected (percent)
Gray seal	Not available	Not available	7	348,900	0.002
Harbor seal	156.409	156.409	138	99,340	0.139
Harp seal	Not available	Not available	4	8,300,000	0.00005
North Atlantic right whale	0.034	0.034	1	444	0.225
Short-beaked common dolphin	1.908	3.590	3	52,893	0.002
Bottlenose dolphin	8.140	26.905	16	7,147	0.224
Harbor porpoise	19.895	0.0	9	89,054	0.010

Source: Navy Operating Area (OPAREA) Density Estimates (NODE) for the Northeast OPAREAs: Boston, Narragansett Bay and Atlantic City, August 2007; Waring et al., 2012

Note: mi^2 = square mile

[a] Transco's application for an IHA, which is provided as Appendix N, estimates takes for the winter, spring, and summer seasons. In this table, the estimated of number of individuals affected assumes that offshore construction would occur between April and September 2014. Therefore, this table includes an estimated number of individuals for the spring and summer seasons only.

As part of its IHA request, Transco proposed the following mitigation/monitoring procedures to minimize impacts on marine mammals resulting from operation of the vibratory hammer:

- The extent of the zone of influence (i.e., the area extending up to 3.0 miles from pile driving activities as shown in Figure 4.5.2-2) would be verified using a range finder or hand-held global positioning system (GPS) device.

- Soft-start procedures would be used before the start of each pile-driving session. Transco would operate the vibratory hammer for 15 seconds at 40 to 60 percent reduced power, followed by a 60 second waiting period to encourage species to leave or avoid the area. This procedure would be repeated two additional times before the vibratory hammer is operated at full power for pile driving.

- NOAA Fisheries-approved observers would be deployed to conduct surveys before, during, and after all vibratory pile-driving activities to monitor for marine mammals within the zone of influence. This monitoring would begin 30 minutes before and end 30 minutes after any pile driving activity.

- Two NOAA Fisheries-approved observers would be stationed on the escort boat, which would be located approximately 1.5 miles from the active pile driving. The escort boat would monitor the entire 1.5 mile perimeter, with the observers visually monitoring 360 degrees around the vessel (i.e., between the pile driving and the vessel and from the vessel out to the extent of the zone of influence) using binoculars or other observation devices.

- Pile-driving activities would be conducted when lighting and weather conditions allow the two NOAA Fisheries-approved observers to visually monitor the entire zone of influence. In the event that fog or poor lighting conditions develop while pile driving activities are occurring, the pile driving would be shut down until the entire zone of influence could be monitored by the observers.

- Sightings of marine mammals within the zone of influence would be documented and the observers would monitor the animals for any abnormal behaviors displayed while vibratory pile driving is occurring or shortly after the pile driving has ended. Abnormal behaviors could include aggressive behavior (e.g., tail/flipper slapping or abrupt directed movement), avoidance of the sound source, or an obvious startle response (e.g., a rapid change in swimming speed, erratic surface movements, or sudden diving associated with the onset of a sound source).

- The vibratory hammer would be shut down if abnormal behaviors by a marine mammal are observed within the zone of influence. Pile-driving activities would not resume until the animal leaves the zone of influence.

- Information to be recorded during each observation of a marine mammal would include the behavior of the animal, the number of individuals observed, the frequency of observation, the activity of the vibratory pile driver at the time of the observation (e.g., pre-pile driving, soft-start, active pile-driving, or post-pile driving), and the reaction of the animal to the pile-driving activity.

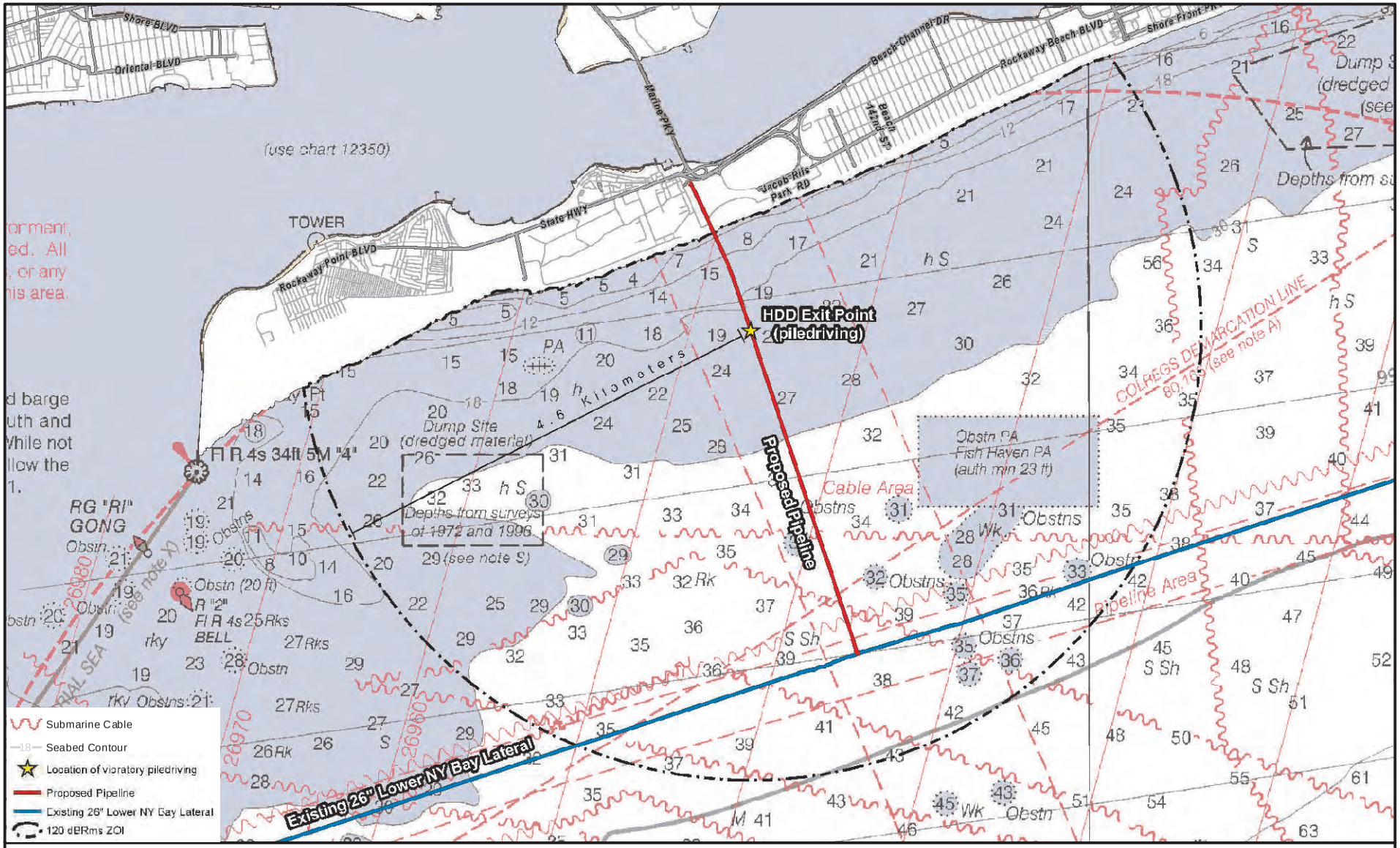

Figure 4.5.2-2

Rockaway Delivery Lateral

and Northeast Connector Projects

Zone of Influence for Noise Impacts on Marine Mammals

during Construction of the Rockaway Delivery Lateral

Source: NOAA 2009

Transco would provide NOAA Fisheries with a draft monitoring report within 90 days after the conclusion of the monitoring. This report would include a summary of the activity and monitoring plan (dates, times, and locations); a summary of mitigation implementation; monitoring results and a summary that addresses the goals of the monitoring plan; environmental conditions at the time of monitoring (e.g., water and weather conditions); survey data including when observations were made and the number and species of marine mammals observed; a description of observed behaviors; and an assessment of the implementation and effectiveness of the prescribed mitigation and monitoring measures.

We have reviewed Transco's proposed mitigation measures, but we have not completed our consultations with NOAA Fisheries regarding impacts on marine mammal species during construction of the Rockaway Delivery Lateral. Therefore, **we recommend that:**

- **Transco should not begin offshore construction activities for the Rockaway Delivery Lateral until:**

  a. the FERC staff receives written comments from NOAA Fisheries, Protected Resources Division regarding impacts on marine mammals and Transco's proposed mitigation measures;

  b. NOAA Fisheries issues an IHA to Transco; and

  c. the Director of OEP approves Transco's plans and notifies Transco in writing that the mitigation measures may be implemented and construction may proceed.

4.5.2.3 Terrestrial Wildlife Impacts

Rockaway Delivery Lateral

Transco proposes to utilize the HDD construction method for the onshore portion of the Rockaway Delivery Lateral. As a result, no temporary or long-term impacts are anticipated on federally and state-designated significant habitats. The HDD would cross under Jacob Riis Park and would not impact the ground surface within the park, except for foot traffic to monitor the path of the HDD for inadvertent releases of drilling fluid during drilling operations. The foot traffic would not affect terrestrial wildlife or their habitats in Jacob Riis Park. See Section 4.7.1 for a discussion of impacts on federally listed threatened and endangered species and other special status species.

The sole onshore area that would be affected by construction of the Rockaway Delivery Lateral is the temporary HDD entry workspace and tie-in to the National Grid pipeline on the TBTA property north of Jacob Riis Park. The HDD operations at this location would disturb less than an acre of grass (assuming this area has been revegetated by National Grid) in an area that is routinely mowed by the TBTA. This area provides marginal habitat for wildlife and would be restored after the pipeline is installed in accordance with Transco's Plan (Appendix D).

Metering and Regulating Facility

Transco proposes to construct the M&R facility within an existing airplane hangar complex at Floyd Bennett Field, and would utilize temporary workspace located in adjacent paved areas. The pavement in this area is broken and includes sparse patches of herbaceous vegetation, but it does not

provide significant wildlife habitat. As such, it is unlikely that Transco's use of the area would affect wildlife at the construction site. While wildlife in the area surrounding the hangar complex could be temporarily disturbed by construction noise, most species in this area have become accustomed to elevated background noise levels due to the developed setting of the area. Consequently, construction activities associated with the M&R facility would likely have a minor and temporary effect on nearby wildlife species.

During scoping, we received comments concerning the impact of the M&R facility operation on honey bees. There are several managed colonies of honey bees on Floyd Bennett Field and there is concern that the noise and vibration of the M&R facility could affect bee behavior. This concern is evaluated in Section 4.8.9.

Compressor Station 195

Construction activities at Compressor Station 195 would occur within the existing station yard, which is maintained by Transco. This area, which includes Transco's existing buildings and areas covered by crushed stone, gravel, mowed grass, and hedgerows, provides marginal habitat for wildlife. While construction could temporarily displace wildlife to adjacent forested and agricultural areas, the station would be restored after construction is complete (with the exception of areas covered by new buildings) in accordance with the FERC Plan. For these reasons, we believe that construction activities associated with the Northeast Connector Project would have a minor and temporary effect on wildlife species at Compressor Station 195.

4.5.2.4 Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the MBTA (16 USC 703-711; MBTA). Bald and Golden Eagles additionally are protected under the BGEPA (16 USC 668-668d; BGEPA). Executive Order (EO) 13186 (66 Federal Register 3853) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the FWS. EO 13186 states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and that particular focus should be given to addressing population-level impacts.

On March 30, 2011, the FWS and the Commission entered into a Memorandum of Understanding (MOU) that focuses on avoiding or minimizing adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary MOU does not waive legal requirements under the MBTA, BGEPA, ESA, Federal Power Act, NGA, or any other statute and does not authorize the take of migratory birds.

To assist in our review of the Rockaway Project, Transco provided the Commission with the list of Birds of Conservation Concern (BCC) for the New England/Mid-Atlantic Coast region (Bird Conservation Region [BCR] 30) as published by the FWS. This list identifies 45 species including 29 species that breed in BCR 30 and 16 species that winter in the region. We also reviewed the list of BCC for the Piedmont region (BCR 29), which includes Compressor Station 195. This list identifies 16 species that breed in BCR 29 and 2 species that winter in the Piedmont region. All of the migratory BCCs and other sensitive bird species that occur in BCRs 29 and 30 are listed in Table 4.5.2-3. See Section 4.7.1 for a discussion of impacts on migratory birds which are also federally-listed as threatened or endangered species.

TABLE 4.5.2-3
List of Birds of Conservation Concern and other Sensitive Bird Species in the New England/Mid-Atlantic Coast and Piedmont Regions for the Rockaway and Northeast Connector Projects

Breeding species [a]	Non-Breeding/Wintering Species [a]
American Bittern *(Botaurus lentiginosus)* [b]	Audubon's Shearwater *(Puffinus lherminieri)* [b]
American Oystercatcher *(Haematopus palliates)* [b]	Buff-breasted Sandpiper *(Tryngites subruficollis)* [b]
Bachman's Sparrow [c]	Greater Shearwater *(Puffinus gravis)* [b]
Bald Eagle *(Haliaeetus leucocephalus)*	Horned Grebe *(Podiceps auritus)* [b]
Bewick's Wren (*bewickii* spp.) [c]	Hudsonian Godwit *(Limosa haemastica)* [b]
Black Rail *(Laterallus jamaicensi)*	Lesser Yellowlegs *(Tringa flavipes)* [b]
Black Skimmer *(Rynchops niger)* [b]	Marbled Godwit *(Limosa fedoa)* [b]
Blue-winged Warbler *(Vermivora cyanoptera)*	Purple Sandpiper *(Caldris maritima)* [b]
Brown-headed Nuthatch *(Sitta pusilla)*	Red Knot *(Calidris canutus rufa)* [b]
Cerulean Warbler *(Dendroica cerulean)*	Red-throated Loon *(Gavia stellata)* [b]
Golden-winged Warbler *(Vermivora chrysoptera)* [b]	Rusty Blackbird *(Euphagus carolinus)*
Gull-billed Tern *(Gelochelidon nilotica)* [b]	Semipalmated Sandpiper *(Calidris pusilla)* [b]
Henslow's Sparrow *(Ammodramus henslowii)*	Short-billed Dowitcher *(Limnodromus griseus)* [b]
Kentucky Warbler *(Oporornis formosu)*	Short-eared Owl *(Asio flammeus)*
Least Bittern *(Ixobrychus exili)* [b]	Solitary Sandpiper *(Tringa solitaria)* [b]
Least Tern *(Sternula antillarum)* [b]	Whimbrel *(Numenius phaeopus)* [b]
Loggerhead Shrike *(Lanius ludovicianu)* [b]	
Nelson's Sharp-tailed Sparrow *(Ammodramus nelson)* [b]	
Oyster Catcher *(Haematopus palliates)* [d]	
Peregrine Falcon *(Falco peregrine)*	
Pied-billed Grebe *(Podilymbus podicep)* [b]	
Piping Plover *(Charadrius melodus)* [e]	
Prairie Warbler *(Dendroica discolor)*	
Red-headed Woodpecker *(Melanerpes erythrocephalu)* [b]	
Saltmarsh Sharp-tailed Sparrow *(Ammordramus caudacutus)* [b]	
Seaside Sparrow *(Ammodramus maritimus)* [b]	
Sedge Wren *(Cistothorus platensis)* [b]	
Snowy Egret *(Egretta thula)* [b]	
Swainson's Warbler [c]	
Upland Sandpiper *(Bartramia longicauda)* [b]	
Whip-poor-will *(Caprimulgus vociferu)*	
Wilson's Plover *(Charadrius wilsonia)* [b]	
Wood Thrush *(Hylocichla mustelina)*	
Worm-eating Warbler *(Helmitheros vermivoru)* [b]	

Sources: U.S. Fish and Wildlife Service, 2008

[a] Species listed in alphabetic order by common name (*scientific name).*

[b] BCR 30 only.

[c] BCR 29 only.

[d] Not included on the lists for BCR 29 or 30, but identified as a Species of Special Concern in New Jersey.

[e] Not included on the lists for BCR 29 or 30, but federally listed as endangered under the Endangered Species Act.

The potential impacts of the Rockaway Project on BCCs and other migratory birds would include the temporary loss of habitat associated with removal of 0.7 acre of existing maintained lawn at the onshore HDD entry site (assuming this area has been revegetated by National Grid), and disturbance of an estimated 1.9 acres of herbaceous vegetation growing through and around the paved areas surrounding the proposed M&R facility site. While these areas provide marginal habitat for migratory birds, noise and other construction activities could potentially affect foraging, courtship, and breeding activities of birds in nearby areas or temporarily displace birds into adjacent habitats. Given the urbanized nature of these areas, it is likely that birds have become accustomed to elevated background noise levels. Use of the HDD method to install the pipeline beneath the shoreline would avoid impacts on birds using this area. Noise associated with the HDD would be masked by existing ambient noise at the shoreline (e.g., noise due to waves and wind).

Construction activities at Compressor Station 195 would result in the temporary loss of marginal habitat due to clearing in areas where the surface vegetation consists of mowed grass or hedgerows. Noise and other construction activities could displace birds into adjacent habitats, which could increase competition for food and susceptibility to predation and interfere with normal breeding activities. These impacts would be temporary as birds would likely return to the area following construction.

Migratory birds are unlikely to be affected as a result of operations of the Projects. Because Transco does not plan to conduct any vegetation maintenance following construction of the Rockaway Delivery Lateral and M&R facility, operational activities at these sites would be infrequent and short in duration. Ongoing maintenance activities at Compressor Station 195 would require periodic mowing of grass areas in the station yard, but this activity already occurs at the site. The noise associated with operations at the proposed M&R facility and at Compressor Station 195 would be minor and localized to the immediate areas surrounding these sites (see the discussion of noise impacts in Section 4.11.2).

Construction of the Projects could contribute to cumulative impacts on migratory birds associated with the development of other projects in the same timeframes and areas as the proposed Projects. A discussion of cumulative impacts on wildlife, including birds, is provided in Section 4.13.6.

Potential impacts on migratory birds would be minimized by Transco's route, site, and workspace selections for the Projects, which avoid wooded, scrub/shrub, or natural grass habitats, and instead would disturb terrestrial habitats of marginal value such as maintained areas and artificial surfaces. While some waterbirds use the shorelines of the Rockaway Peninsula and the surrounding areas for foraging and cover (FWS, 2007), Transco proposes to use the HDD construction method to place the Rockaway Delivery Lateral under this area, which would avoid or minimize disturbance of the birds. We believe these measures would minimize the effects of the Projects on BCCs and other migratory birds.

4.5.3 Operation Impacts

4.5.3.1 Rockaway Delivery Lateral

Transco proposes to retain a 50-foot-wide permanent operational right-of-way, both onshore and offshore within the GNRA,[15] and a 200-foot-wide permanent right-of-way seaward of the GNRA boundary. As the HDD section of the pipeline beneath Jacob Riis Park would generally be inaccessible deep below the surface, Transco would not actively maintain the onshore right-of-way and the land would continue to be managed for existing uses by the NPS. Additionally, Transco would not actively maintain

[15] The easement on NPS lands would be based on a 10-year, renewable lease agreement, the terms of which would be negotiated between the NPS and Transco.

the sea bottom within the offshore right-of-way. Therefore, no impacts on wildlife or benthic organisms are expected as a result of right-of-way maintenance activities.

As previously stated, Transco would remove sediment over the subsea manifold using a submersible pump or divers using hand-jetting or air-lifting equipment about every 7 years during operations. The impacts associated with maintenance activities would be similar to construction impacts, but on a much smaller scale. As such, maintenance activities would result in minor, temporary impacts on the benthic habitat at the maintenance location. Therefore, no significant adverse effects on wildlife habitat or overall populations are expected from pipeline operation or maintenance activities.

4.5.3.2 Metering and Regulating Facility

Transco's M&R facility would be located in Hangars 1 and 2 at Floyd Bennett Field. Because the proposed facilities would be located inside the hangar complex, operation of the facility would have a negligible impact on the surrounding environment, including wildlife. As discussed in Section 4.11.2, operation of the M&R facility is not expected to increase the day-night ambient A-weighted noise level at nearby NSAs by more than 1.5 dB, which is below the level detectable by the human ear (Hoover and Keith, Inc., 2012a). Additionally, Transco would adhere to applicable permit requirements for stormwater and sewage discharge to the existing municipal drainage system as well as requirements for proper storage and disposal of petroleum products (e.g., lubricants) used during operations. Therefore, post-construction operation and maintenance of the M&R facility is not expected to have any significant adverse impacts on surrounding wildlife.

4.5.3.3 Compressor Station 195

Operations and maintenance activities at Compressor Station 195 would likely have a minor and temporary effect on wildlife species. Regular equipment maintenance would occur as recommended by the manufacturer in the buildings and on the existing piping and other facilities within the compressor station yard. As noted above, periodic mowing would continue in areas covered by grass at the site. Transco would adhere to applicable requirements for stormwater discharges and for storage of hazardous materials, such as petroleum products. As discussed in Section 4.11.2, the noise levels at Compressor Station 195 would exceed the FERC standard of 55 decibels on the A-weighted scale (dBA) for compressor station operations at a nearby NSA, but the noise would be less than the measured values for current ambient conditions at the site.

4.6 FISHERIES AND AQUATIC RESOURCES

4.6.1 General Fisheries and Aquatic Resources

The Rockaway Delivery Lateral would extend 2.86 miles into the Atlantic Ocean in an area called the New York Bight. In addition to impacts associated with installation of the pipeline, the Rockaway Project would also require the transport of construction materials from the pipe yard in Elizabeth, New Jersey to the offshore construction site. This would require shipping materials through Elizabeth Reach, North of Shooters Island Reach, Constable Hook Reach, Bergen Point East Reach, Bergen Point West Reach, and Ambrose Channel.

The offshore portions of the Rockaway Delivery Lateral are located in a marine system that supports numerous fish species managed by NOAA Fisheries under the MSA. Specifically, the pipeline would cross designated EFH for 21 species (see more about EFH and the MSA in Section 4.6.3). In addition, this area is suitable for shellfish harvesting, primary and secondary contact recreation, and fishing.

The Atlantic Ocean and proximal coastal and estuarine waters support diadramous (fish that migrate between fresh and salt water) and marine fisheries and are home to finfish species of ecological, commercial, and recreational importance. A NYSDEC-funded trawl survey from 2005 to 2007 identified bay anchovy and round herring as the most abundant forage species in the area. Other important recreational, commercial, and forage species found during the study or that are typical in local waters include Atlantic mackerel, bluefish, alewife, Atlantic sea herring, American shad, scup, Atlantic menhaden, butterfish, striped bass, spiny dogfish, summer flounder, red hake, tautog, weakfish, silver hake/whiting, witch flounder, and winter flounder.

Long-finned squid were also identified in the NYSDEC trawl survey. Squid are highly mobile, schooling, pelagic invertebrates that prey on small finfish and crustaceans. Their short lifespan, rapid growth, and capacity to spawn year-round lead to a seasonally dynamic resource. Egg masses are generally attached to rocks on sandy/muddy bottoms and to vegetation in late spring and summer.

Marine benthic organisms in the New York Bight are ecologically significant and consist of a wide variety of marine invertebrates such as worms (polychaetes and oligochaetes), crustaceans (shrimp, lobster, and amphipods), bivalves (clams and mussels), and corals that burrow into or are in contact with the substrate. Wigley and Theroux (1981) and others (e.g., NOAA Fisheries, 2011f) have noted high benthic abundances in the New York Bight area.

The New York Bight is also home to the Atlantic surfclam, one of several bivalves that make up the bulk of the current filter-feeding mollusk population. The New York Bight supports a major commercial surfclam fishery, and the proposed pipeline route is within a portion of the Atlantic Ocean that is designated as a certified shellfish area by NYSDEC.

Several species of crustaceans commonly are found in Atlantic coastal waters, including blue crab, lady crab, rock crab, red crab, green crab, and American lobster. Horseshoe crabs (an arthropod) are another species located in the Rockaway Project area. Horseshoe crabs are an economically and medically important species on the east coast of the United States (Horseshoe Crab Research Center, 2009). Horseshoe crab eggs and larvae are important for migratory birds, other crab species, and several gastropods. In addition, horseshoe crabs are common prey for the sea turtles and finfish known to use the area.

Northern star coral is a temperate coral that Transco identified in the vicinity of the proposed Rockaway Delivery Lateral attached to artificial reef structures. Northern star coral is a sessile, filter-feeding organism that requires hard substrate for colonization.

Plankton (phytoplankton and zooplankton, including ichthyoplankton) are small free-floating or weakly swimming organisms that drift in the water column. Phytoplankton assemblages in the New York Bight have been associated with specific salinity and temperature regimes. Judkins et al. (1979) noted that zooplankton assemblages in the New York Bight varied in relation to major seasonal events directly associated with water mass movements. Ichthyoplankton in the area contain eggs and larvae for many fish and invertebrate species. Smith et al. (1979) reported that seasonal spikes were observed in spring, summer, and, to a lesser extent, fall. Larval abundance and species diversity begin to increase in the spring, peak during summer and early autumn, and decline sharply in late fall to a low in winter.

Sea turtles are a marine reptile known to be present in the Rockaway Project area. All of the species that potentially occur in the area are federally and state-listed threatened or endangered species. These are addressed in Section 4.7.1.

Construction of the Northeast Connector Project would not affect surface water resources. Therefore, no impacts on fisheries or aquatic species would result from this project.

4.6.2 Aquatic Impacts and Mitigation

Construction of the offshore portion of the Rockaway Delivery Lateral could impact aquatic resources and fisheries in several different ways. The extent of the impact on aquatic resources would depend on the construction methods used, the existing conditions at the offshore construction sites, the species inhabiting the affected areas, the mitigation measures employed, and the timing of construction. Most of the impacts on aquatic resources would be short-term effects associated with increases in turbidity and sedimentation resulting from construction activities (e.g., trenching and HDD operations).

Construction of the pipeline would disturb approximately 29.0 acres of ocean floor excluding the area affected by fallout of displaced sediments from jetting and dredging. The majority of this disturbance would be associated with the proposed offshore excavations. These would include dredging and trenching involving the use a clamshell dredge, jet sled, hand-jetting equipment, and a suction dredge. The use of this equipment and the proposed construction methods could have both direct and indirect impacts on aquatic resources. Direct impacts would include temporary displacement of the seabed and the organisms inhabiting it. Indirect impacts would include suspension of sediments in the water column, which could clog the gills of fish and other aquatic species, and the redistribution of sediments that fall out of suspension, which could bury benthic and demersal species, resulting in mortality of eggs and other life stages. Benthic invertebrates and demersal (bottom-dwelling) fish species in or near the excavation area would be most affected. Pelagic fish, sea turtles, and marine mammals could also be affected and would likely vacate and temporarily avoid the area of disturbance.

4.6.3 Essential Fish Habitat

The MSA (16 USC § 1801 et seq.) established a management system for marine fisheries resources in the United States. In particular, the Congress charged NOAA Fisheries and fishery management councils, along with other federal and state agencies and the fishing community, to identify habitats essential to managed species, which include marine, estuarine, and anadromous finfish, mollusks, and crustaceans. These habitats, which are identified as EFH, include "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

Federal agencies that authorize, fund, or undertake activities that may adversely impact EFH must consult with NOAA Fisheries. Although absolute criteria have not been established for conducting EFH consultations, NOAA Fisheries recommends consolidated EFH consultations with interagency coordination procedures required by other statutes, such as NEPA or the ESA, to reduce duplication and improve efficiency.

We have reviewed the information submitted by Transco and performed our own research. Our analysis of the potential for the Rockaway Project to impact EFH and managed species is provided in this final EIS. We requested that NOAA Fisheries consider the draft EIS as our official EFH assessment for the Rockaway Project. NOAA Fisheries provided written comments on the draft EIS and conservation recommendations for EFH on January 30, 2014.

4.6.3.1 Managed Fish Species and Essential Fish Habitat

The offshore portion of the Rockaway Delivery Lateral is located within the EFH boundaries defined as 40° 40.0N, 73° 50.0W, 40° 30.0N, and 74° 00.0W. The boundaries of this area are shown on Figure 4.6.3-1. NOAA Fisheries Northeast Regional Office EFH designation tables were reviewed to identify managed species for which EFH could potentially occur in the vicinity of the Rockaway Delivery Lateral. This review identified 21 managed species. Information on these species and the EFH characteristics associated with their various life stages is provided in Table 4.6.3-1. [16]

4.6.3.2 Assessment of Potential Impacts on Essential Fish Habitat

Many of the potential impacts on EFH and managed fish species would be similar to those discussed for surface waters and aquatic species and their habitats in Sections 4.3.2 and 4.6.2, respectively.

Timing of Construction

The season in which construction takes place can influence the degree of impacts associated with construction activities. Construction during periods of sensitive fish activity could cause greater impacts than construction during other periods. Transco proposes to complete offshore construction activities during the spring and summer. Water conditions during these seasons are optimal for greater numbers of benthic invertebrates and early life stages for certain fish species, but other fish species are less likely to be present during these times of the year.

Sediment Loads and Turbidity

The proposed Rockaway Delivery Lateral would use several different offshore excavation methods. The pit at the HDD exit point would be excavated by a clamshell dredge. The pipeline trench between the proposed interconnect with the LNYBL and the HDD exit point would be excavated using a jet sled. The trenches for the subsea manifold, hot-tap, and cathodic protection system would be excavated using hand jets. Backfilling would be conducted with a suction dredge, hand jets, or clamshell dredge. All four of these construction techniques would increase turbidity and disperse and redistribute sediments. Increases in turbidity can affect fish physiology and/or behavior. Potential physiological effects include mechanical abrasion of surface membranes, delayed larval and embryonic development, reduced bivalve pumping rates, and interference with respiratory functions. Possible behavioral effects from increased turbidity include interference with feeding for sight-foraging fish and area avoidance.

[16] Impacts on Atlantic sturgeon, which is a federally listed threatened species, are addressed in Section 4.7.1.2.

Figure 4.6.3-1
Rockaway Delivery Lateral
and Northeast Connector Projects
Essential Fish Habitat in the Vicinity
of the Rockaway Delivery Lateral

TABLE 4.6.3-1
Designated Essential Fish Habitat for Atlantic Ocean Waters near Rockaway Beach [a] for the Rockaway Project

Species	Life Stage [b]	Essential Fish Habitat Characteristics [c]
Silver hake (Whiting) (*Merluccius bilinearis*)	Eggs	Surface waters; <68 °F (20 °C); 164-492 feet
	Larvae	Surface waters; <68 °F (20 °C); 164-426 feet
	Juveniles	Bottom habitat of all substrate types; <70 °F (21 °C); >20 ppt; 66-886 feet
Red hake (*Urophycis chuss*)	Eggs	Surface waters of intercontinental shelf; <50 °F (10 °C); <25 ppt
	Larvae	Surface waters; <66 °F (19 °C); > 0.5 ppt; <656 feet
	Juveniles	Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops; <61 °F (16 °C); 31-33 ppt; <328 feet
Winter flounder (*Pseudopleuronectes americanus*)	Eggs	Bottom habitats with a substrate of sand, muddy sand, mud, and gravel; <50 °F (10 °C); 10-30 ppt; <16 feet
	Larvae	Pelagic and bottom waters; <59 °F (15 °C); 4-30 ppt; <20 feet
	Juveniles	Bottom habitats with a substrate of mud or fine grained sand; <77 °F (25 °C); 10-30 ppt; 3-164 feet
	Adults	Bottom habitats including estuaries with substrate of mud, sand, gravel; <77 °F (25 °C); 15-33 ppt; 3-328 feet
Windowpane flounder (*Scophthalmus aquosus*)	Eggs	Surface waters: <68 °F (20 °C); <230 feet
	Larvae	Pelagic waters: <68 °F (20 °C); <230 feet
	Juveniles	Bottom habitats with a substrate of mud or fine grained sand; <77 °F (25 °C); 5.5-36 ppt; 3-328 feet
	Adults	Bottom habitats including estuaries with substrate of mud, sand, gravel; <81 °F (27 °C); 5.5-36 ppt; 3-246 feet
Atlantic sea herring (*Clupea harengus*)	Juveniles	Pelagic waters and bottom habitats; <50 °F (10 °C); 26-32 ppt; 49-443 feet
	Adults	Pelagic waters and bottom habitats; <50 °F (10 °C); >28 ppt; 66-426 feet
Monkfish (*Lophius americanus*)	Eggs	Surface waters; <64 °F (18 °C); 49-3,281 feet
	Larvae	Pelagic waters; 59 °F (15 °C); 82-3,281 feet
Bluefish (*Pomatomus saltatrix*)	Juveniles	Pelagic waters; 66-75 °F (19-24 °C); 23-36 ppt
	Adults	Pelagic waters; 57-61 °F (14-16 °C); >25 ppt
Butterfish (*Peprilus triacanthus*)	Larvae	Pelagic waters; 48-66 °F (9-19 °C); 6.4-37 ppt; 33-6,001 feet
	Juveniles	Pelagic waters (larger individuals found over sandy and muddy substrates); 37-82 °F (3-28 °C); 3-37 ppt; 33-1,197 feet (most <394 feet)
	Adults	Pelagic waters (schools form over sandy, sandy-silt, and muddy substrates); 37-82 °F (3-28 °C); 4-26 ppt; 33-1,197 feet (most <394 feet)
Atlantic mackerel (*Scomber scombrus*)	Juveniles	Pelagic waters; 39-72 °F (4-22 °C); >25 ppt; 0-1,050 feet
	Adults	Pelagic waters; 39-61 °F (4-16 °C); >25 ppt; 0-1,247 feet
Summer flounder (*Paralichthys dentatus*)	Larvae	Pelagic waters, larvae most abundant 12-52 miles from shore; southern areas 12-52 miles from shore; 48-54 °F (9-12 °C); 23-33 ppt (fresh in Hudson R. Raritan Bay area); 33-230 feet; mid-Atlantic Bight from September to February; southern part from November to May at depths of 29-98 feet
	Juveniles	Demersal waters, muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds; 39-72 °F (4-22 °C); 25 ppt; 0-1,050 feet
	Adults	Demersal waters and estuaries; 0-82 feet; inhabit shallow coastal and estuarine waters during warmer months and move offshore on outer continental shelf at depths of 492 feet in colder months

TABLE 4.6.3-1 (cont'd)
Designated Essential Fish Habitat for Atlantic Ocean Waters near Rockaway Beach [a] for the Rockaway Project

Species	Life Stage [b]	Essential Fish Habitat Characteristics [c]
Scup (*Stenotomus chrysops*)	Eggs	Pelagic waters in estuaries; 55-73 °F (13-23 °C); >15 ppt; <98 feet
	Larvae	Pelagic waters in estuaries; 55-73 °F (13-23 °C); >15 ppt; <66 feet
	Juveniles	Demersal waters north of Cape Hatteras, and inshore on various sands, mud, mussel, and eelgrass bed type substrates; >45 °F (7 °C); >15 ppt; 0-125 feet
	Adults	Demersal waters north of Cape Hatteras and Inshore estuaries (various substrate types); >45 °F (7 °C); >15 ppt; 7-607 feet; wintering adults (November to April) are usually offshore south of New York to North Carolina
Black sea bass (*Centrropristis striata*)	Juveniles	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds and shell patches may be used during wintering; >43 °F (6 °C); >18 ppt; 3-125 feet
	Adults	Structured habitats (natural and manmade), sand and shell substrates preferred; >43 °F (6 °C); >20 ppt; 66-164 feet
King mackerel (*Scomberomorus cavalla*)	Eggs Larvae Juveniles Adults	Sandy shoals of capes and offshore bars, high-profile rock bottoms and barrier island ocean side waters from surf zone to shelf break but from the Gulf Stream shoreward; including *Sargassum.* In addition, all coastal inlets, all state-designated nursery habitats of particular importance to coastal migratory pelagic; >68 °F (20 °C); >30 ppt
Spanish mackerel (*Scomberomorus maculates*)	Eggs Larvae Juveniles Adults	Sandy shoals of capes and offshore bars, high-profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* In addition, all coastal inlets, all state-designated nursery habitats of particular importance to coastal migratory pelagic; >68 °F (20 °C); >30 ppt
Cobia (*Rachycentrol canadum*)	Eggs Larvae Juveniles Adults	Sandy shoals of capes and offshore bars, high-profile rock bottoms and barrier island ocean-side waters from surf zone to shelf break but from the Gulf Stream shoreward; high salinity bays, estuaries, seagrass habitat; >68 °F (20 °C); >25 ppt
Sand tiger shark (*Carcharias taurus*)	Larvae	Shallow coastal waters; <82 feet
Dusky shark (*Carcharhinus obscures*)	Larvae	Shallow coastal waters, inlets, and estuaries; <82 feet
Sandbar shark (*Carcharhinus plumbeus*)	Larvae	Shallow coastal waters; <82 feet
	Juveniles	All coastal and pelagic waters; <82 feet
	Adults	Shallow coastal waters; <164 feet
Little skate (*Raja erinacea*)	Juveniles Adults	Sand, gravel, and mud substrates
Winter skate (*Leucoraja ocellata*)	Juveniles Adults	Sand, gravel, and mud substrates
Clearnose skate (*Raja eglanteria*)	Juveniles Adults	Soft bottom, rocky, or gravelly substrates

Sources: NOAA Fisheries, Northeast Regional Office, 2013a ; NOAA Fisheries, Northeast Regional Office, 2013b ; NOAA Fisheries, Southeast Regional Office, 2006

[a] Area of analysis for 10-minute square boundaries is 40º 40.0' N, 73º 50.0' W, 40º 30.0' N, and 74º 00.0' W, which includes Atlantic Ocean waters partly within the Hudson River estuary affecting the following: western Rockaway Beach, western Jamaica Bay, Rockaway Inlet, Barren Island, Coney Island except for Norton Point, Paerdegat Basin, Mill Basin, southwest of Howard Beach, Ruffle Bar, and many smaller islands.

[b] Designated essential fish habitat along the Rockaway Delivery Lateral is present in areas where characteristics are present.

[c] °F = degrees Fahrenheit; °C = degrees Celsius; ppt = parts per thousand (salinity); > = greater than; < = less than.

In addition to the physiological and behavioral effects, turbidity tends to interfere with light penetration and thus reduces photosynthetic activity by phytoplankton. Such reductions in primary production would be localized around the immediate area of the dredging, jetting, and backfilling operations and would be limited to the duration of the sediment plume. Excessive nutrient loading resulting from suspension of sediments can have the opposite effect, causing a dramatic increase in the productivity of planktonic algal populations. Eggs and larvae are the life stages that are most likely to be directly affected by a temporary increase in turbidity and potential decrease in dissolved oxygen concentrations. These life stages are more sensitive and are unable to move from the affected areas and, therefore, would be more susceptible to impacts compared to juveniles and adults.

As described in Section 4.3.2.3, Transco conducted hydrodynamic and sediment transport modeling to assess the potential effects of the Rockaway Project on turbidity and the redistribution of sediments. Several model simulations were run to evaluate the concentrations of suspended sediments, spatial extent and duration of sediment plumes, and the seabed deposition resulting from each of the construction activities. The model input variables were validated using in situ current velocity, water surface elevations, temperature, and salinity measured by an Acoustic Doppler Current Profiler deployed near the south end of the pipeline route between July and August 2009. The grain size distributions used for modeling were based on benthic (grab) samples collected along the proposed pipeline route, which indicate the sediments are primarily composed of very fine sand (with a settling rate of 0.15 inches per second). Copies of Transco's hydrodynamic and sediment transport analysis and subsequent addendums, which describe the modeling methods, assumptions, and results in more detail, are included in Appendix O. A summary of the sediment modeling results for each construction method is provided below and in Table 4.6.3-2.

The draft EIS evaluated turbidity and sedimentation impacts for offshore trenching assuming a single pass of the jet sled along the pipeline route. Subsequent to publication of the draft EIS, and through refinement of the project design, Transco modified its proposal from one to three passes of the jet sled and reduced the trenching rate from 1,200 feet per hour under a "worst case" single-pass scenario to a range of 200 to 400 feet per hour for the three-pass scenario. Transco also stated that the discharge nozzles of the jet sled would be configured for backfill of the trench during the third (final) pass of the jet sled. In conjunction with these changes, Transco reduced the width of the offshore workspace for jet sled and suction dredge operations from approximately 70 feet to 38 feet based on a change in assumptions regarding the slope of the sidewalls to the trench. Specifically, Transco's revised analysis assumes a slope of 1:3 vertical to horizontal rather than 1:5 as assumed in the analysis provided in the draft EIS. [17] The result of all these changes would be a reduction in the extent of turbidity and sedimentation impacts but an increase in the duration of trenching activities as described in the draft EIS and in the updated discussions below.

[17] Transco states that the original assumption of a 1:5 vertical to horizontal slope for the trench and a width of 70 feet for the offshore excavation area was a conservative estimate for evaluating a "worst-case" scenario for impacts due to turbidity and sedimentation. The current assumption of a 1:3 vertical to horizontal slope for the trench and a width of 38 feet for the offshore excavation area is based on feedback Transco received from offshore construction contractors regarding operation of the jet sled and suction dredge.

TABLE 4.6.3-2

Summary of Sediment Transport Model Results for the Rockaway Project

Construction Rate	Duration of Construction (hours)	Total Sediment Volume Released (yards^3)	Maximum Depth of Sediment Deposition (inches) [a]	Area of Deposition Greater than 0.1 inch (acres)	Total Plume Duration (hours) [b]	Extent of Suspended Solids Plume 50 mg/L [c] (miles)	Maximum Total Suspended Solids within Water Column (mg/L)		
							Surface Layer	Mid Layer	Bottom Layer
Mechanical Dredging at the Horizontal Directional Drilling Exit Pit									
30 cycles per hour	170	15,300	40.3	45	172	0.3	21	271	1,351 [d]
Jet Sled Trenching "Three Pass" Scenario [e]									
200 to 400 feet per hour	177	24,620	2.4	306	180	0.6	1.1	5,152	2,902
Hand Jetting at Hot-Tap Site									
4 pulses	8 (per pulse)	31,200 (for four pulses)	85.1	69	11 (per pulse)	1.2	1.8	173	10,509
Suction Dredge									
100 feet per hour	228	4,500	0.7	50	229	0.1	0.2	26	316

Notes:

mg/L milligrams per liter

≤ less than or equal to

[a] The deposition levels reported in this table are averaged for each cell in the ECOM model grid. Cells immediately adjacent to the pipeline measure 164 feet by 328 feet. As a result of the averaging, actual deposition near the trench would be higher (thicker) than the maximum average predicted by the model in each cell. See Appendix O for additional information on the methods and results of the model.

[b] This is an estimate of the time required for construction plus the time required for the plume to dissipate.

[c] The New York State TOGS 5.1 identifies a TSS level of 50 mg/L as the default thresholds for both chronic and acute toxicity due to dredging activities.

[d] This is not the maximum concentration for dredging. The maximum concentration for dredging (1,819 mg/L) would occur near, but not at, the bottom layer. This is due to the side casting of excavated material from the clamshell bucket as it moves above the seafloor.

[e] Assumes the jetting trench has a length of 11,308 feet (which includes a 1,000-foot-long "pigtail" extension where the pipeline trench connects to the HDD exit pit) and a cross-sectional excavation area of 58.8 square feet. The scenario assumes the trench sidewalls will collapse and reach stable side slopes and partially bury the pipeline.

Dredging at the HDD Exit Pit

The HDD method would be used for the nearshore portion of the proposed pipeline. The HDD exit point would be located approximately 0.7 mile offshore. The HDD method would allow the pipeline to be installed beneath the sea floor without directly affecting aquatic resources, except in the location of the offshore exit pit, which would be dredged and used to contain drilling fluids and cuttings released during the HDD operation.

Excavation of the HDD exit pit would affect approximately 6.1 acres of the seabed, including areas affected by side-casting spoil adjacent to the pit. The pit itself would be roughly triangular in shape, measuring approximately 374 feet in length by 210 feet in width at the seabed, and extend to a maximum estimated depth of about 20 feet below the seabed (see Figure 2.3.1-7). Turbidity and suspended sediment concentrations would temporarily increase during the excavation of the pit.

As described in Appendix O, sediment releases due to dredging were simulated in the model as a point source to the bottom layers of the water column. The model predicts that the concentration of TSS near the exit pit would be in excess of 1,800 mg/L above ambient levels. The concentration of suspended

sediments is expected to decrease rapidly with increasing distance from the exit pit due to the relatively high settling velocities of the sandy sediments. Most of the suspended sediments would settle close to the exit pit, although a plume of suspended sediments with a TSS concentration at or above 50 mg/L (i.e., the thresholds for both chronic and acute toxicity due to dredging activities under the New York State TOGS) would extend up to 0.3 mile from the pit. These changes in water quality are expected to be short term as the model predicts that the plume would dissipate in the water column within about 2 hours after the dredging stops. The deposition of sediments, like the TSS concentration, would also diminish with distance from the excavation site. The modeling predicts that the thickness of accumulated sediments would be about 40.3 inches at the exit pit but less than 0.05 inch about 0.5 mile from the construction site.

We received a conservation recommendation from NOAA Fisheries on January 30, 2014 stating that material dredged from the HDD exit pit should not be side-cast on the seafloor adjacent to the exit pit to minimize impacts on benthic communities and federally managed EFH species. While placing excavated material on a barge could reduce the area of impact on the seabed, we do not believe it would provide any significant advantages over the current proposal. As indicated in our construction alternative for post-lay dredging in Section 3.7.1, placing excavated spoil on a barge would result in a turbidity plume that extends throughout the water column. This is due to sediment wash (i.e., loss of sediments) as the clamshell bucket moves through and breaks the surface of the water as well as dewatering of excavated spoil from the barge (Palermo et al., 2008; Bridges et al., 2008; Hayes et al., 2007). Bridges et al. (2008) found that operation of a clamshell dredge results in a bimodal distribution of suspended sediments with peaks occurring near the seabed and at the surface of the water. In contrast, the turbidity plume due to side-casting would be limited to the bottom layers of the ocean.

We additionally note that movement of sediment already occurs along the seabed as a result of typical wave conditions and storm events. Transco's hydrodynamic and sediment transport analysis (see Appendix O) concluded that sediment bedload transport rates range from about 0.4 square meter per day (m^2/d) at the seaward end of the proposed pipeline route to 2.8 m^2/d near the exit pit under typical wave conditions. Bedload transport rates increase significantly due to storm events. For example, Transco's hydrodynamic and sediment transport analysis concluded that bedload transport rates in the offshore construction area increase to about 13.1 m^2/d during 5-year wave events associated with storms. Higher sediment transport rates occur during major storm events such as hurricanes, which rework and redistribute sediments along the shoreline. High sedimentation rates would result from side-casting spoil adjacent to the trench, but the overall effect on the marine environment would be minor and limited to a small area surrounding the pit. In contrast, sedimentation due to bedload transport associated with major storm events affects a much larger area of the seabed.

NOAA Fisheries commented that sedimentation impacts on hard-bottom areas of the seabed, including areas containing northern star coral, could be reduced by storing spoil from the HDD exit pit on a barge. Transco's offshore surveys indicate that the majority of the coral in the offshore construction area is far from the exit pit with only one area of hard-bottom habitat within 0.5 mile of the pit (see Figure 4.5.2-1). Consequently, we do not believe that storing the spoil on barges would reduce impacts on coral.

The potential difference in impacts on other benthic species as a result of storing spoil on barges would also be minor. The benthic species inhabiting the area in and around the exit pit are typical of, and widespread throughout, the New York Bight region and are accustomed to regular disturbance due to surfclam dredging and natural storm events. We also note that benthic communities are expected to recover within 1 to 2 years following construction. For these reasons, we conclude that sedimentation due to side-casting would not significantly affect benthic species. Additional discussions regarding impacts on northern star coral and benthic communities in the offshore construction area are provided in the subsections below.

Storing excavated spoil from the exit pit on barges as opposed to side-casting it on the seabed would also cause additional impacts due to increased vessel traffic in the offshore construction area. Depending on the capacity of available barges, several barges could be required to accommodate the volume of material excavated from the pit. Additional tug traffic would be required to move and position the barges in the construction area, and possibly to transport the barges to a dock or anchorage area for temporary storage while the HDD operation is completed. The additional barge and tug traffic would increase air emissions due to construction, which could exceed air quality thresholds and trigger General Conformity review. Air emissions for the Rockaway Project are discussed in Section 4.11.1.

For all the reasons discussed above, we conclude that the side-cast option would not cause a significant impact on aquatic resources. Further, when considering the temporary nature of the impact, and impacts on other resources (e.g., air quality) that would result from using the barge storage option, the side-cast option would have impacts that are less than those for the barge storage option.

Jet Sled Trenching for the Offshore Pipeline

Transco would use a jet sled to lower the offshore pipeline between the HDD exit pit and the subsea hot-tap and manifold. Three passes of the jet sled over the pipeline route would be required to complete the installation. During the third pass, the discharge nozzles would be configured to backfill the trench by expelling material behind the sled and into the trench. Transco's modelling assumed that operation of the jet sled would result in the discharge of approximately 24,620 cubic yards of sediment into the water column. The modeling results indicate that instantaneous TSS concentrations may reach high levels near the seabed but would drop to the 50 mg/L level at the seabed within approximately 0.6 mile of the trench. The modeling results further indicate that the sediment plume would be negligible at the surface even very close to the jetting operation (maximum predicted surface concentrations are 1.1 mg/L). The sediment plume would dissipate within about 3.0 hours after the jetting operation ends. Based on the above, Transco does not expect construction of the Rockaway Delivery Lateral to result in turbidity levels that would exceed New York State water quality standards for surface waters of the Atlantic Ocean (i.e., no increase that causes a substantial visible contrast to natural conditions) due to the sandy character of the substrate.

Outside the trench, the modeling results indicate that areas closest to the trench would be subject to the highest levels of sedimentation, with the depth of re-deposited sediments diminishing as the distance from the jet sled operation increases. Specifically, the modeling predicts average accumulations beyond the trench of up to 2.4 inches in each model cell along the trenchline, with thicker deposits in areas immediately adjacent to the trench. Average deposition greater than 1.2 inches would be confined to an area within 100 feet of the trench centerline; and sedimentation would not exceed 0.4 inches at distances greater than 800 feet from the trench. Measurable sediment depths would not extend beyond 0.5 mile from the trench.

Hand Jetting for the Subsea Hot-tap and Manifold

Transco would use diver operated hand jets for installation of the subsea hot-tap and manifold. The modeling for hand jetting of sediments in this area assumed that 31,200 cubic yards of sediment would be released into the bottommost layer of the water column in four 8-hour pulses. Based on this assumption, the maximum instantaneous suspended sediment concentrations would exceed 10,500 mg/L near the seabed, although for the reasons described above (e.g., rapid settling of suspended sediment), the water column concentrations would be near background levels (1 to 3 mg/L) approximately 2.4 hours after the jetting ceases. The modeling predicts that the maximum increase in bed thickness due to hand jetting would be 85.1 inches, but that sediment accumulations would decrease to less than 0.4 inch within about 0.1 mile of the hot-tap site.

Additional Hand Jetting for the Cathodic Protection System

Transco would install a cathodic protection system to protect the pipeline against corrosion. As discussed in Section 2.0, the system would consist of approximately 1,200 feet of anode cable laid perpendicular to the pipeline in the vicinity of the HDD exit pit, with an anode sled installed at the terminus of the cable. All excavation for this activity would be conducted by hand jetting, which would result in the displacement of up to 7,800 cubic yards of sediment along the cable trench and at the anode sled installation site. Transco did not conduct sediment transport modeling for this activity, although model results for other activities suggest that the sediment plume from hand jetting for the anode bed/sled would last no more than 3.0 hours after the jetting operation ends.

Transco provided a qualitative estimate of the sedimentation resulting from hand jetting along the anode bed based on downscaling of the sediment transport modeling results from the subsea manifold and hot-tap excavation. This estimate assumes that grain size distributions and ocean currents are the same at both sites, which are located about 2 miles apart. The sedimentation associated with hand jetting for the anode bed/sled would be less than it is for the subsea manifold and hot-tap, but it would impact a wider area because sediments would be released to the water column along the length of the trench.

Backfilling

Transco would configure the discharge nozzles on the third pass of the jet sled to expel sediment behind the sled and provide backfill as the pipe is lowered into the trench. Additional backfill would be provided by sloughing of the trench sidewalls during jetting and by natural infill as sediments migrate across and settle into the trench.

Following installation of the pipeline, Transco would conduct a hydrographic survey to document seafloor elevations along the pipe trench as well as other offshore excavation areas, such as the trenches for the subsea hot-tap and manifold and the cathodic protection system. Transco would backfill any areas such that the seabed is restored to pre-existing conditions and there is 4 feet of cover over the pipeline and other facilities using native sediments withdrawn from the seabed. Transco would add a top layer of sediments over the drilling fluid and cuttings that collect within the offshore HDD exit pit both to cap these materials and restore the contours of the seafloor in this area. Additionally, we are recommending in Section 4.6.3.2 (see below) that Transco file a post-construction hydrographic monitoring plan for the subsea pipeline to ensure that the seabed is restored.

As discussed in Section 2.3.1.9, Transco would obtain fill for the pipeline trench, as necessary, from the seafloor in the area immediately adjacent to the trench. Backfill sediment would be withdrawn with a suction dredge from the seabed along either side of the pipeline. The backfill retrieved by the suction dredge would consist of sediment disturbed by the jet sled that settles adjacent to the trench augmented by additional sediment from the seafloor.

Operation of the suction dredge would result in turbidity and sedimentation impacts similar to those described for the jet sled but on a smaller scale. Modeling assumed that operation of the suction dredge would result in a release of about 4,500 cubic yards of sediment into the bottom layers of the water column. This would result in a sediment plume where TSS concentrations exceed 50 mg/L within about 0.1 mile of the trench. The plume is expected to dissipate with about an hour after operation of the suction dredge ceases. The modeling predicts that the maximum increase in bed thickness due to operation of the suction dredge would be 0.7 inch, and that the area affected by the deposition of sediment would be limited to within 0.25 mile of the trench.

When completed, the suction dredging would result in shallow trenches measuring about 8.1 feet wide by 1.35 feet deep along either side of the pipe trench. The seabed disturbance would be similar in

scale to that caused by a hydraulic surfclam dredge (see Figure 2.3.1-12). A NOAA Fisheries study indicated that surfclam dredge tracks in approximately 36 feet of water lost definition within 24 hours due to sediment transport and other factors, such that they were difficult to recognize and "blended in with the general bottom features" (Meyer et al., 1981). Based on this study, the area of the seabed disturbed by operation of the suction dredge would likely return to ambient conditions within a few days of backfilling.

Use of the clamshell dredge or hand jetting to backfill the HDD exit pit or other excavation areas would also result in turbidity and sedimentation in the bottom layers of the ocean. While Transco did not model these activities, impacts would be similar to those for the excavations with the clamshell dredge and hand jets but on a much smaller scale. Sediment plumes are expected to dissipate within a few hours after completion of the backfilling.

Summary of Sedimentation and Turbidity Effects

Dredging and jetting would create turbidity plumes in the water column, which have the potential to clog fish gills, obscure visual stimuli, and reduce food intake for benthic filter feeders. Some demersal fish that are adapted to higher turbidity environments could be drawn to the sediment-generating activities as a source of food, but juvenile and adult pelagic fish would likely swim away from the plumes. Turbidity and suspended sediment concentrations could impact bivalves (such as Atlantic surfclams) and other benthic organisms by causing suffocation. An increased sediment load could increase the likelihood of sediment becoming trapped in a bivalve. It is possible that the increased sediment load would result in the mortality of some clams and other benthic organisms.

The duration of the turbidity plumes due to operation of the jet sled would be short-lived and the depth of sedimentation would be less than 0.4 inch at distances greater than 800 feet from the pipeline. Measureable sedimentation from all construction activities would be confined to a distance of about 0.5 mile from the pipeline trench. Transco would mitigate for any short-term loss of surfclams in this area by coordinating with the New York surfclam fishing community to see if it is possible to harvest in the vicinity of the Rockaway Delivery Lateral in the months immediately prior to construction, which may substitute for the harvesting of clams from other areas. Transco would monitor construction activities (e.g., visual inspection by divers) and adjust activities (e.g., by modifying the speed of the jet sled) to reduce excessive turbidity. These measures would minimize the detrimental effects of turbidity and sedimentation, and it is expected that the benthos in the affected areas would recover quickly through recruitment and other processes. Additionally, we are recommending in Section 4.6.3.2 (see below) that Transco file a post-construction benthic sampling and monitoring plan for the subsea pipeline to ensure that benthic communities recover as expected.

We received a comment from the USACE regarding the potential effects of sedimentation on coral in the vicinity of the Rockaway Delivery Lateral. The sonar targets identified on Figure 4.5.2-1 represent hard-bottom habitats in the vicinity of the proposed pipeline that could be inhabited by hard coral species such as northern star coral. Coral in the vicinity of trenching activities could be stressed or killed depending on the thickness of sediment as it settles out of the water column on the seafloor.

Riegl (1995) found that hard coral species are able to withstand episodic deposition of about 31 milligrams per square centimeter of sediment (equivalent to a layer measuring about 0.04 inch in thickness), but showed stress responses or death when exposed to continuous deposition at this rate. Riegl (1995) also found that hard coral are able to eject and remove sediment at rates ranging from about 1.1 to 4.2 milligrams per square inch per minute. At this rate, coral could remove a layer measuring 0.04 inch thick in about 30 minutes.

Peterson and Pilson (1985) found no significant stress in northern star coral buried by 31 milligrams per square inch of sediment every day for a period of 4 weeks. Each day, the coral ejected and

removed the sediment in about 1 to 2 hours. Peterson and Pilson (1985) also found that northern star coral survived when buried at a rate of 93 milligrams of sediment per square inch (equivalent to a layer measuring about 0.16 inch in thickness) every day for a period of 4 weeks. The coral showed signs of cellular damage after 2 weeks, but growth rates returned to normal several weeks after the sediment was removed. Another study documented a mortality rate of 50 percent when sediment-tolerant coral species were completely buried for a period of 16 days (Erftemeijer et al., 2012).

Coral in the vicinity of the Rockaway Delivery Lateral could experience stress or possibly death in areas where deposition on the seafloor due to sedimentation would exceed 0.16 inch. Based on the sediment transport modeling described above, we estimate that up to 376 acres [19] of seafloor potentially containing hard-bottom habitat occupied by coral could experience sediment deposition in excess of this threshold. This area represents a tiny fraction of the New York Bight, which encompasses over 2 million acres. In many cases, but especially at distances further from the trench, sediment deposited on coral would be removed a result of wave action or ejected by the coral themselves. Therefore, we do not believe that sedimentation would have a significant impact on coral due to construction of the Rockaway Delivery Lateral.

Resuspension of Contaminated Sediments

The proposed excavations could disturb and suspend contaminated sediments into the water column, which could expose biota to contaminants and have a direct negative impact on managed species and other aquatic organisms. Any contaminants that are mobilized could be bio-transferred within food chains with the potential to cause injury. To assess these risks, Transco evaluated historical data of sediment chemistry and conducted sediment sampling along the proposed pipeline route using the NYSDEC TOGS for In-Water and Riparian Management of Sediment and Dredged Material guidelines. Transco determined that the sediments along the route of the Rockaway Delivery Lateral consist primarily of sands. Historical data of sediment chemistry in the area of the proposed pipeline route indicate that effects from contaminate exposure would be negligible (e.g., Mecray et al., 2003). This conclusion is supported by Transco's December 2010 analyses of bulk sediment chemistry near the proposed pipeline route. Specifically, Transco found that the levels of all contaminants tested, which included VOCs, PAHs, PCBs, dioxin, and metals, were below the NYSDEC's TOGS thresholds, except for one sample, where the mercury concentration was slightly higher than the TOGS threshold (see Section 4.2.2). Based on these results, it is unlikely that managed species or other aquatic organisms would be affected by the resuspension of contaminated sediments.

Loss/Reduction of Benthic Community Taxa

Direct impacts on benthos from pipeline installation and other bottom-disturbing activities would result in adverse effects on benthic macroinvertebrates, with subsequent secondary adverse effects on EFH species (e.g., fish or invertebrates) through reduction of forage species. Direct impacts on benthic organisms would include crushing, localized disruption, removal, turn over, and deposition of sediment.

Transco conducted benthic surveys in the summer of 2009 and fall of 2010 to determine the composition of the existing benthic community along the proposed pipeline route. During the 2009 survey, benthic community samples were collected at eight stations just to the east of the proposed pipeline route. During the 2010 survey, benthic community samples were collected at six locations along the proposed pipeline route.

[19] This is an estimate of the area where average trenching-induced sedimentation in the ECOM model cells could exceed 0.1 inch (0.4 cm) in thickness, including areas of overlap subject to sediment deposition from different offshore construction activities.

The surveys indicate that the benthic communities along the proposed route are dominated by shellfish, marine worms, and crustaceans. Shellfish densities were found to be lowest at the nearshore and far offshore sampling locations, and highest at the intermediate locations. The densities of marine worms and crustaceans generally displayed the opposite trend with higher densities at the nearshore and the far offshore locations and lower densities at intermediate stations. During the 2009 survey, three species, Atlantic surfclam (Spisula solidissima), the amphipod crustacean Rhepoxynius epistomus, and the marine worm Nephtys incise, comprised more than 50 percent of the total individuals identified at most of the sampling locations. During the 2010 survey, the most prevalent species included Atlantic surfclam, an amphipod crustacean (Protohaustorius sp.), and two marine worms (Polygoridius sp. and Tharyx sp.). Video observations from the 2010 benthic sampling identified starfish on the seabed at most of the sampling stations as well as hermit crabs and egg casings of a marine snail along the proposed pipeline route.

As indicated above, Transco estimates that approximately 29.0 acres of the seabed would be directly impacted by construction and that another 45.2 acres [20] of benthic habitat would be affected by the deposition of up to 1.2 inches of sediments falling out of suspension. As most benthic infauna live on or within the upper 6 inches of the sediment surface, benthic infauna within this 74.2-acre area would be stressed or lost.

Many factors affect the recolonization process for invertebrates, such as the texture of disturbed sediments and hypoxia in overturned sediments. Because of this, recovery rates for benthic communities can vary. Studies from Long Island Sound (Murray and Saffert, 1999; Rhoades et al., 1978), the Hudson River (AKRF, Inc., et al., 2012), and Massachusetts Bay (Germano et al., 1994) indicate that recovery to an equilibrium community occurs within 2 years or less. Papers by Hirsch et al. (1978) and LaSalle et al. (1991), cited in a 2013 Biological Opinion (BO) issued by NOAA Fisheries for the Tappan Zee Bridge Replacement Project in New York City, indicate that recovery rates of benthic macroinvertebrates following dredging range from a few weeks or months to a few years, depending upon the type of project, the type of bottom material, the physical characteristics of the environment, and the timing of disturbance (NOAA Fisheries Northeast Region, 2013a). In a two year monitoring study in the lower Hudson River, Bain et al. (2007) reported that within a few months following dredging, fish and benthic communities at a dredged location were no different from seven nearby sites that had not been dredged. Additionally, the results of this study showed no lasting effects on benthic communities at the dredged site.

Based on all these studies, we expect that impacted benthic communities in the construction area would re-establish within a short time as native assemblages recolonize the affected area or a new community develops as a result of immigration of animals from nearby areas or from larval settlement. Thus, no long-term impacts on the benthic community are expected.

We received a conservation recommendation from NOAA Fisheries that a post-construction monitoring plan should be developed and implemented to assess recovery of the benthic community in the offshore construction area. Therefore, **we recommend that:**

- **Prior to construction of the offshore portion of the Rockaway Delivery Lateral, Transco should file with the Secretary a post-construction benthic sampling and monitoring plan for review and written approval by the Director of OEP. The plan should identify the duration of the monitoring period, the timing of sampling surveys, success criteria for assessing recovery of benthic species, and reporting requirements. Transco should also file comments from NOAA Fisheries on the plan.**

[20] This is an estimate of the area where average trenching-induced sedimentation in the ECOM model cells could exceed 1.2 inches (3 cm) in thickness, including areas of overlap subject to sediment deposition from different offshore construction activities.

The potential for direct and indirect impacts on managed species with designated EFH along the Rockaway Delivery Lateral from trenching and substrate disruption is likely to differ from species to species depending on life history, habitat use (demersal vs. pelagic), distribution, and abundance. It is anticipated that short-term impacts on older life stages (juvenile and adult) of fish would be limited to temporary displacement during initial installation of the pipeline.

Noise Effects on Fish

Marine fish and invertebrates can be affected by noise, both physiologically and behaviorally. Transco proposes to use a vibratory hammer, which produces a lower noise level than standard pile driving equipment. As discussed in Section 4.5.2.1, the noise generated by the vibratory hammer (based on Transco's analysis) would exceed the injury and behavioral thresholds for fish, but within relatively short distances from the pile driving activity. Noise would exceed the injury threshold within distances of 7.1 feet for fish weighing 2 grams or more and 13.1 feet for fish weighing less than 2 grams. Noise would exceed the behavioral threshold for all fish within a distance of 151 feet from the pile driving activity. As noted above, we have added a recommendation in Section 4.5.2.1 that Transco file a noise monitoring and mitigation plan to ensure that actual noise is consistent with predicted values and/or to reduce noise to acceptable levels.

Given the short distances predicted for noise impacts, and Transco's plan to implement soft-start procedures for the vibratory hammer, fish are likely to move away from the area before noise levels from the pile driving exceeds the injury and behavioral thresholds. Additionally, the installation and removal of the piles would occur over a relatively short period. Transco estimates that it would take about 60 seconds of continuous driving to install each individual pile, and that all the piles would be installed over a period of approximately 10 days. The total operating time of the vibratory hammer for extraction of the piles at the end of the construction period is expected to be similar to the installation time. Therefore, the proposed pile driving is not expected to have a significant impact on fish in the vicinity of the Rockaway Delivery Lateral.

As discussed in Section 4.5.2.1, background noise in the underwater environment would be similar to the noise generated by the largest vessels used during construction of the Rockaway Project. Therefore, noise associated with operation of construction vessels is not expected to affect fish.

Release of HDD Drilling Fluid and Cuttings

Transco proposes to excavate a pit at the offshore HDD exit site to collect and contain anticipated releases of drilling fluid and cuttings during the HDD operation. Transco estimates that a total of about 12,000 to 15,000 cubic yards of drilling fluid and cuttings would collect in this pit. Based on the cohesive properties of the bentonite mixture in saltwater, this material is expected to settle out and remain stable at the bottom of the pit due to particle aggregation (flocculation) (Berner and Berner, 1996; Middleton and Southard, 1977; A.H. Glenn, 2011; and Akther et al., 2008). While the settling rate is unknown, it is expected to occur quickly as the drilling fluid enters the marine environment. Additionally, as noted above, the discharge would be subject to requirements identified in applicable standards and permits, such as the New York State water quality standards and the NYSDEC's water quality certificate, including any requirements associated with discharge of additives in the drilling fluid.

Juvenile and adult finfish in the vicinity of the HDD exit pit would have enough mobility to avoid the bentonite discharge. Additionally, because the drilling fluid is expected to remain in the pit, pelagic or benthic species in areas outside the pit would not be harmed. Any demersal eggs that settle in the pit during construction likely would be smothered by the drilling fluid resulting in their mortality, and recolonization of the pit by marine organisms would be inhibited prior to backfill. As discussed in Section 2.3.1.9, Transco would add a top layer of sediments over the drilling fluid and cuttings that

collect within the offshore HDD exit pit both to cap these materials and restore the contours of the seafloor. The top layer additionally would facilitate recolonization of benthic species in this area.

Ecotoxicity of Drilling Fluid and Cuttings

Transco's proposed drilling fluid would consist of a water-based mud containing bentonite and associated additives rather than oil- or synthetic-based mud systems that have been shown to have higher chronic toxic effects (Cranford et al., 2001). Transco has not determined the specific additives that would be used, but identified examples of additives typically used in HDD operations. The additives include compounds which affect the properties of drilling fluids. For example, additives are used to provide viscosity control, stabilize the fluid, enhance the rate of penetration, and cool and lubricate the drilling equipment.

The ecotoxicity of a majority of the additives typically used in HDD operations have been tested for one or more aquatic species and determined to be either not acutely toxic or slightly toxic.[21] Transco reported that the combined initial concentrations of bentonite and these other additives would remain below 10 percent (100,000 ppm) of the total volume of the drilling fluid and would not create acutely toxic conditions for benthic fauna. Additionally, as indicated above, the drilling fluid is expected to remain stable at the bottom of the exit pit and not escape into the surrounding area based on the cohesive properties of the drilling fluid in saltwater.

Transco stated that the specific additives to be used in the drilling fluid would be determined at the time of construction based on field conditions and interactions between the HDD equipment and sediments along the drill path. However, we received a comment from NOAA Fisheries stating that information regarding the concentration and dilution rates of the additives is necessary to assess impacts on aquatic species, including the potential for bioaccumulation of additives in the food chain. Therefore, to ensure that the additives used during drilling are clearly documented and provided to NOAA Fisheries, **we recommend that:**

- **<u>Prior to construction of the Rockaway Delivery Lateral</u>, Transco should file an assessment identifying the specific additives that would be used in the HDD drilling fluid, including:**
  - **a. the material safety data sheets for each additive;**
  - **b. the concentration and dilution rates for each additive;**
  - **c. an evaluation of the toxicity of each additive;**
  - **d. an evaluation of the potential for bioaccumulation of each additive in the food chain; and**
  - **e. comments from NOAA Fisheries on the assessment.**

[21] Acute toxicity describes the adverse effects of a substance resulting from a single exposure or from multiple exposures in a short period of time. The toxicity categories referenced in this document are based on definitions from the Pesticide Action Network (www.pestidideinfo.org) which describe the immediate effects of exposure (within 0 to 7 days) of aquatic species to a pesticide based on the LC_{50} (i.e., the lethal concentration for 50 percent of test organisms) measured in parts per million (ppm). Very highly toxic = <0.1 ppm; highly toxic = 0.1 to 1 ppm; moderately toxic = 1 to 10 ppm; slightly toxic = 10 to 100 ppm; and not acutely toxic = >100 ppm.

Restoration of the Seafloor to Ambient Conditions

Transco initially proposed to allow the offshore excavation areas to infill via natural sediment transport processes. Transco conducted a study (see Appendix O) to estimate the time required to complete natural infill of the excavation areas. The study used historical wave data and engineering formulae to assess sediment transport rates along the route of the proposed pipeline. The results of Transco's study suggest that under typical wind-driven wave conditions, the annual infill rate would be about 343,100 cubic yards per year at the shoreward end of the pipeline (including the cathodic protection system and the HDD exit pit), and about 47,800 cubic yards per year at the seaward end of the pipeline (including the subsea hot-tap and manifold). Infilling along the entire pipeline route under these conditions could occur within less than 2 years. Transco proposed to monitor the natural infilling over a 2-year period, and backfill any areas that do not infill by the end of the monitoring period.

We received several comments from the USACE and NYSDEC regarding Transco's initial proposal to allow the offshore excavation areas to infill via natural sedimentation processes. The agencies expressed concerns regarding safe operation of the pipeline during the period of natural infill; impacts on aquatic species due to the open trench (e.g., long shore movement of horseshoe crabs along the trench); and future impacts on aquatic species, particularly benthos, in the event that backfilling is required at the end of the monitoring period. Additionally, the USACE stated that it will require active backfilling of the offshore excavation areas to surrounding ambient conditions at the time of construction as a condition to any permit it may issue for the Rockaway Project.

As discussed above, Transco modified the proposed action from natural to active backfill in response to the agency comments. Backfill of the pipe trench initially would be accomplished by configuring the discharge nozzles on the third pass of the jet sled to expel sediment behind the sled directly into the trench, by sloughing of the trench sidewalls during the jetting operation, and by natural infill as sediment migrates across and settles into the trench. Following the installation of the pipeline and other facilities, Transco would conduct a hydrographic survey to document seabed elevations in the construction area. Transco would backfill any areas such that the seabed is restored to pre-existing conditions and there is 4 feet of cover over the pipeline and other facilities. Backfill would consist of native sediments withdrawn from areas adjacent to the pipeline with a suction dredge. Transco would also add a top layer of native sediments over the drilling fluid and cuttings that collect within the offshore HDD exit pit using the clamshell dredge or hand jets. Other offshore excavation areas would be backfilled using hand jets.

We received a conservation recommendation from NOAA Fisheries regarding instances on other subsea pipeline projects where bottom contours were not fully restored after backfilling because of sediment migration or settling of the sediments in the trench over time. We subsequently received a conservation recommendation from NOAA Fisheries stating that annual hydrographic modeling of the subsea pipeline alignment should be conducted for up to 5 years following construction to ensure that seabed contours have been restored and to assess the need for remedial measures such as additional backfilling. Therefore, **we recommend that**:

- **Prior to construction of the offshore portion of the Rockaway Delivery Lateral, Transco should file with the Secretary for review and written approval by the Director of OEP a 5-year plan for annual, post-construction, hydrographic monitoring of the seabed along the pipeline route. The plan should identify the timing of annual surveys, success criteria for assessing restoration of the seabed, reporting requirements, and the implementation of remedial measures, if necessary. Transco should also file comments from NOAA Fisheries on the plan.**

With the implementation of this recommendation, we determined that there would be few discernable permanent impacts on the contours of the seafloor from pipeline construction.

Entrainment or Entrapment

Approximately 573,500 gallons of seawater would be used to conduct hydrostatic testing of the pipeline. Juvenile and early stage adult fish and invertebrates could be impinged on the intake screens and zooplankton could be entrained or entrapped. The seawater would be filtered through a 200-size mesh screen (mesh opening of 0.0029 inch or 0.07 millimeter). It is assumed that any eggs or larvae entrained during hydrostatic testing would be killed. Spawning areas for several EFH taxa, including Pollock, Atlantic cod, winter flounder, and others, may occur in the vicinity of the Rockaway Delivery Lateral. Historical information (1977 to 1984) for ichthyoplankton within the Southern New England geographic area showed that several of the EFH species addressed by this assessment (e.g., Atlantic mackerel, red hake, whiting [silver hake], scup, bluefish, and summer flounder) are listed as principal taxa found during spring and fall ichthyoplankton surveys (NOAA Fisheries, 1988). Therefore, it is likely that these species may be more vulnerable to entrainment impacts during hydrostatic testing. It should be noted that NOAA's survey included marine waters out to the 1,000-meter bathymetric contour, so densities and predominant ichthyoplankton species found at the hydrostatic test water withdrawal location could vary.

NOAA Fisheries' data (Ecosystem Monitoring Program [ECOMON] and Marine Resources Monitoring, Assessment, and Prediction [MARMAP] Program) indicate that egg densities for all taxa in northeast Atlantic marine waters typically range from one to three eggs per 1,000 L (cubic meter) of water; larvae densities are about half the density of eggs. Considering the volume of water required for testing, the Rockaway Project would likely result in the loss of 4,342 eggs and 2,171 larvae (all taxa combined). Considering the high fecundity potential for all EFH species addressed, along with natural mortality, this limited entrainment of eggs and larvae during hydrostatic testing is not expected to cause any measureable impact on fisheries' populations within the northeast Atlantic Ocean.

Hydrostatic testing could impinge juvenile and early stage adult fish and invertebrates on intake screens during the intake process. The number of juveniles and early stage adult fish and invertebrates injured or killed would be small due to the short filling times and the limited occurrence of these animals near the intake hoses.

Biocides and Other Chemicals Additives in the Hydrostatic Test Water

Transco would infuse the 573,500 gallons of seawater that is used for hydrostatic testing with a non-oxidizing biocide (such as X-CIDE®) at a concentration of 200 ppm and an oxygen scavenger (such as B-542 or equivalent) at a concentration of 100 ppm to prevent corrosion of the pipeline during testing. In addition, a fluorescent dye (or equivalent) at a concentration of 23 ppm would be added to the test water to aid in detecting leaks in the pipeline. The active ingredients typically associated with these compounds include tetrakis (hydroxymethyl) phosphonium sulfate (THPS) in the biocide, sodium bisulfates in the oxygen scavenger, and fluorescein disodium in the dye. Information on ecotoxicity suggest that fluorescein disodium is not acutely toxic to aquatic organisms (i.e., the LC_{50} is greater than 100 ppm), and that THPS and sodium bisulfates are not acutely toxic or are slightly toxic (i.e., the LC_{50} is 10 to 100 ppm) to aquatic organisms (Pesticide Action Network Database, 2012a, 2012b). Biocides have been shown to cause high mortality of Atlantic herring eggs and larvae at sufficient concentrations (Blaxter, 1977).

The hydrostatic test water would remain within the pipeline for a period of 30 days during which the active ingredients in the biocide, oxygen scavenger, and fluorescent dye would begin to degrade. Additionally, Transco would pump the hydrostatic test water from the pipeline into a multi-port diffuser

before it is discharged back into the marine environment. This would re-oxygenate the water and mix the discharged water within the surrounding seawater thereby dispersing (diluting) at a rate of 15:1 the concentrations of the biocide and oxygen scavenger. The resulting concentrations are not expected to cause adverse effects on marine organisms. The discharges additionally would be subject to New York State water quality standards as well as any requirements identified in applicable permits, such as the NYSDEC's water quality certificate, including any requirements associated with discharge of the scavenger, biocide, and dye. Additional information on the oxygen scavenger, biocide, and fluorescent dye is provided in the subsections below.

Oxygen Scavenger

As described above, the oxygen scavenger added to the hydrostatic test water would be B-542 or equivalent applied at a concentration of 100 ppm. The active ingredient in oxygen scavengers is sodium bisulfite. Information on the ecotoxicity of sodium bisulfite suggests it is not acutely toxic to fish or nematodes and slightly acutely toxic to zooplankton and mollusks. Data on acute toxicity are available for five freshwater fish species. Of these, only one – a freshwater fathead minnow – exhibited acute toxic effects when exposed to concentrations below 230 ppm. The lowest observed effect concentration (LOEC) in fathead minnow to sodium bisulfite was 78 ppm.

Since sodium bisulfite generally comprises only 20 to 40 percent of oxygen scavenger products, the concentration of sodium bisulfite in the hydrostatic test water would likely be less than 78 ppm. Moreover, Transco would use a diffuser to disperse the hydrostatic water when it is discharged from the pipe. These diffusers, which have been shown to be effective at avoiding pollutant accumulation and ecological impacts, are expected to disperse the concentration of the oxygen scavenger at a ratio of 15:1. As such, the concentration of sodium bisulfite is expected to be significantly less than the LOEC in and at the edge of the mixing zone and would not impact marine biota.

Biocide

The proposed biocide would be X-CIDE® or equivalent applied at a concentration of 200 ppm. The active ingredient in X-CIDE is THPS. Since THPS typically comprises only 30 to 60 percent of the product, the concentration of THPS in the hydrostatic test water would likely be between 60 and 120 ppm. Additionally, THPS oxidizes rapidly under aerobic conditions and degrades to phosphate, carbon dioxide, and water.

Ecotoxicity information on THPS suggests that it is slightly toxic to aquatic organisms. Data on acute toxicity for THPS are available for two species of freshwater fish and one species of water flea. Toxicity tests determined the average LC_{50} (i.e., the lethal concentration for 50 percent of the test organisms) for the fish was between 94 to 97 ppm, but mobility impairment occurred in the water flea at a concentration of 15 ppm.

Information from permits for the Northeast Gateway Pipeline Lateral Project based on the use of a similar THPS-based product found that it degraded rapidly during the hydrostatic test. The degradation resulted in an average decrease in the concentration of about 4 ppm per day. Assuming a similar rate of degradation for the Rockaway Project, 200 ppm of THPS would degrade to about 80 ppm over 30 days. Transco's use of the diffuser would disperse the concentration further at an expected ratio of 15:1. As such, the resulting concentration of THPS at the time of discharge is not expected to impact marine biota.

Florescent Dye

The proposed florescent dye would include fluorescein disodium or an equivalent applied at a concentration of 23 ppm. Oceanographers and hydrologist have historically used fluorescein to trace the

flow of currents through bodies of water. Information on the ecotoxicity of fluorescein disodium suggests that it is not acutely toxic to aquatic organisms. Data on acute toxicity are available for five fish species, including one marine species – left-eyed flounder – and one water flea species. The test determined that the lowest average LC_{50} for the fish species was 997 ppm and the average LC_{50} for the water flea was 337 ppm. The proposed concentration of florescent dye would be far below these levels. Consequently, this compound is not expected to have an impact on marine biota.

Fuel and Chemicals Spills

The transport of materials and equipment between the pipe yard and construction site would have little to no effect on aquatic resources but the potential exists for accidental spills of construction-related fluids (e.g., oil, gasoline, or hydraulic fluids) into marine waters that could result in water quality impacts that affect fish, other aquatic organisms, and their habitats. All offshore vessels would be expected to comply with the USCG requirements for the prevention and control of oil and fuel spills (MARPOL, Annex V, Pub. L. 100−220 [101 Stat. 1458]) and would be required to register for the EPA NPDES Vessel General Permit, which includes measures to protect against impacts associated with discharges incidental to the operations of commercial vessels.

Transco stated in its SPCC Plan for the Rockaway Project (see Appendix F) that emergency response procedures for offshore spills would be identified after the contractor has been selected. We have added a recommendation in Section 4.3.2.3 that Transco file an updated SPCC Plan that includes specific measures that would be implemented to identify, control, and clean up any accidental leaks or spills from offshore construction vessels.

4.6.4 Operations Impacts

Operation of the pipeline would have minimal impact on aquatic resources in the Rockaway Project area. The offshore segment of the Rockaway Delivery Lateral would be buried beneath the seabed. The primary impact during operation would be associated with internal inspections of the pipeline, which would occur at a frequency of roughly once every 7 years. Each time one of these inspections is conducted, divers using submersible pumps or hand-jetting equipment would expose the subsea manifold assembly and attach the removable launcher loaded with necessary inspection tools. Divers would then operate the offshore facilities to conduct the in-line inspection. The excavation of the subsea manifold would affect about 0.82 acre of seabed and displace approximately 2,000 cubic yards of sediments, which is about 16 percent of the amount that would be disturbed during the initial tie-in installation of the hot-tap and subsea manifold. The temporary displacement of these sediments would impact EFH for benthic and demersal species in the vicinity, but the impact would be relatively minor considering the small area affected and the long time period between maintenance activities.

We received a comment from NOAA Fisheries regarding the potential impacts on benthic organisms from the electrical current associated with the cathodic protection system. These systems, which have been required on natural gas transmission pipelines since 1971, employ low-voltage current to prevent corrosion in steel pipes. Transco's existing LNYBL utilizes an impressed current cathodic protection system that applies about 1 volt of direct current to the pipeline to prevent external corrosion. We are not aware of any instances where the operation of cathodic protection systems on existing pipelines, including Transco's LNYBL, have affected benthic or other marine species, nor are we aware of any studies suggesting that this is a concern. Based on our experience, we conclude that operation of the cathodic protection system on the Rockaway Delivery Lateral would not affect marine species.

4.6.5 Conservation Measures

As discussed above, Transco would implement several measures to avoid or minimize impacts on EFH. These include:

- use of the HDD method to avoid or minimize impacts on EFH within 0.7 mile of the shore;
- use of mid-line buoys to minimize cable sweep impacts associated with anchoring;
- use of a multi-port diffuser to discharge hydrostatic test water;
- use of a vibratory hammer to install piles; and
- restoration of the seabed to ambient conditions.

In addition to these measures, Transco would implement several project-specific construction and mitigation plans to minimize impacts on the marine environment. We are also recommending that Transco file additional plans for post-construction hydrographic monitoring and benthic sampling to ensure that the seafloor is restored and benthic communities recover as expected.

Transco's HDD Monitoring and Contingency Plan (see Appendix H) outlines measures to minimize the risk of HDD complications and the potential for inadvertent, unplanned releases of drilling fluid as well as for clean-up of inadvertent releases that occur onshore. Transco did not identify any formal monitoring procedures for the area between the shore and the offshore exit pit, but stated that inspection personnel on vessels would inspect this area twice a day and that any inadvertent releases that occur in the offshore area outside the HDD exit pit would be documented and monitored. Additionally, we have added a recommendation in Section 4.3.2.3 that Transco file an updated HDD Monitoring and Contingency Plan that includes response procedures of offshore inadvertent releases of drilling fluids.

Transco would implement an SPCC Plan (see Appendix F) and a Construction Spill Plan (see Appendix G) that include preventive and mitigation measures to avoid or minimize the potential impact of petroleum or hazardous material spills during pipeline construction. These plans include provisions that prohibit the onshore storage of fuel and other potentially toxic materials within specified distances of waterbodies, and procedures for refueling equipment that are designed to minimize potential spills. The plans also outline procedures for containing, cleaning up, and reporting spills. As noted above, Transco's SPCC Plan does not identify emergency response procedures for offshore spills, but we have added a recommendation in Section 4.3.2.3 that Transco file an updated plan that includes specific measures that would be implemented to identify, control, and clean up any accidental leaks or spills from offshore construction vessels.

Transco would comply with all applicable regulatory requirements and programs designed specifically to protect aquatic resources. Transco would conduct turbidity monitoring during construction and would adjust activities (e.g., by reducing the speed of the jet sled) to reduce excessive turbidity to ensure water quality standards are not exceeded.

4.6.6 Conclusions of the Essential Fish Habitat Assessment

Transco's use of the HDD method would avoid or minimize impacts on EFH located within 0.7 mile of the shore. Although potential impacts associated with the HDD method are possible, none of these impacts are expected to be regionally significant due to the small area that would be affected and the relatively short duration of any potential impact.

The jetting and dredging within the Atlantic Ocean for installation of the offshore pipeline segment would impact water quality, benthic substrate, and EFH, but the effect would be temporary and mitigated by several different measures, including restoration of the seabed.

Noise associated with vibratory pile driving could injure fish or disrupt their behavior patterns within a relatively short distance of the pile driving activity. Fish are likely to move away from the area before noise from the pile driving exceeds the injury and behavioral thresholds. Additionally, pile driving would occur for very short periods of time during construction of the project. Noise from construction vessels is not expected to affect fish.

EFH could be affected by a spill of hazardous materials, but Transco's implementation of its SPCC Plan (see Appendix F) and Construction Spill Plan (see Appendix G) would minimize the risk. Finally, EFH could be impacted by the proposed water withdrawals or the discharge of hydrostatic test water infused with biocides or oxygen scavengers, but screening of the intake hose and use of a diffuser to re-oxygenate and dilute the discharge water would minimize the potential for impacts on the managed fish species and designated EFH.

In addition to these measures, we have added several mitigation recommendations in Section 4.6.3.2 to further minimize impacts on EFH. Specifically, we are recommending that Transco file the following information prior to construction:

- an assessment that identifies the specific additives that would be used in the HDD drilling fluid and provides ecotoxicity data for each additive;
- a post-construction hydrographic monitoring plan to ensure that seafloor contours are restored to ambient conditions; and
- a post-construction benthic sampling and monitoring plan to ensure that benthic communities recover as expected.

4.7 THREATENED, ENDANGERED, AND OTHER SPECIAL STATUS SPECIES

Special status species are those for which federal or state agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species classified as threatened or endangered; species considered as candidates or petitioned for federal listing by the FWS or NOAA Fisheries; and species that are designated as state-listed or receive special management considerations by New York State, New Jersey, or Pennsylvania.

Section 7 of the ESA requires federal agencies to ensure that any actions authorized, funded, or carried out by the agencies do not jeopardize the continued existence of a federally listed threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat for a federally listed species. The FWS, which is responsible for terrestrial and freshwater species, and NOAA Fisheries, which is responsible for marine species, jointly administer the law. As the lead federal agency for the Projects, the FERC is required to consult with the FWS and NOAA Fisheries to determine whether federally listed threatened or endangered species or designated critical habitat are found in the vicinity of the Project areas, and determine each proposed action's potential effects on those species or their critical habitats.

For actions involving major construction activities with the potential to affect listed species or designated critical habitats, the FERC is required to report its findings to the FWS and NOAA Fisheries in a Biological Assessment (BA). If the FERC determines that an action is likely to adversely affect a species (this would include any taking actions of a listed species under the MMPA), formal consultation is required. In response, the FWS and/or NOAA Fisheries would issue a BO as to whether or not the federal agency action would likely jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitats. The BO would include binding and/or discretionary recommendations to reduce impacts to a negligible level as well as an Incidental Take Statement (ITS) for those actions that *may affect, but will not jeopardize* the continued existence of ESA listed species or destroy or adversely modify designated critical habitat. An ITS cannot be authorized for a listed marine mammal until an MMPA IHA authorization has been obtained from NOAA Fisheries.

Rockaway Project

Transco, as a non-federal representative of the FERC, sought information regarding the presence of threatened or endangered species, species of special concern, and the existence of critical or significant habitats on or in the vicinity of the Rockaway Project from the FWS and NOAA Fisheries. In addition, Transco informally consulted with appropriate FWS, NOAA Fisheries, NPS, and state agency offices possessing expertise regarding sensitive species, and reviewed threatened and endangered species-related database information. Transco additionally consulted with New York State and New Jersey to identify state-listed species that could potentially occur within the Rockaway Project area.

We reviewed the information submitted by Transco for the Rockaway Project, performed our own independent analyses, and consulted directly with the FWS, NOAA Fisheries, and the NPS. We determined that 12 federally listed species may occur in the vicinity of the Rockaway Project area. One of these eleven species includes five distinct population segments (DPS). We determined that no critical habitat for any federally listed species is present in the Rockaway Project area. Our analysis of the potential for the Rockaway Project to impact the 12 federally listed species and our determination of effect for each of these species are discussed in Section 4.7.1 and listed in Table 4.7-1.

We requested that the FWS and NOAA Fisheries consider the draft EIS as our official BA for the Rockaway Project. Each agency has initiated its review of our determinations of effect for species, but consultation with each agency is ongoing.

TABLE 4.7-1
Federally Listed, Candidate, and Petitioned Species Potentially Occurring in the Rockaway Project Area

Species	Federal Status	Critical Habitat in Project Area [a]	Determination
Marine Mammals [b]			
Fin whale (*Balaenoptera physalus physalus*)	Endangered	No	No effect
Humpback whale (*Megapera novaeangliae*)	Endangered	No	No effect
North Atlantic right whale (*Eubalaena glacialis)*	Endangered	No	May affect and is likely to adversely affect
Marine Fish			
New York Bight DPS [c] of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)*	Endangered	N/A	May affect and is likely to adversely affect
Gulf of Maine DPS [c] of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)*	Threatened	N/A	May affect and is likely to adversely affect
Chesapeake Bay DPS [c] of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)*	Endangered	N/A	May affect and is likely to adversely affect
Carolina DPS [c] of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)*	Endangered	N/A	May affect and is likely to adversely affect
South Atlantic DPS [c] of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus)*	Endangered	N/A	May affect and is likely to adversely affect
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	NA	May affect but is not likely to adversely affect
Sea Turtles			
Leatherback sea turtle (*Dermochelys coriacea)*	Endangered	No	May affect but is not likely to adversely affect
Kemp's ridley sea turtle (*Lepidochelys kempii)*	Endangered	No	May affect but is not likely to adversely affect
Green sea turtle (*Chelonia mydas)*	Threatened	No	May affect but is not likely to adversely affect
Northwest Atlantic Ocean DPS [b] of loggerhead sea turtle (*Caretta caretta)*	Threatened	N/A	May affect but is not likely to adversely affect
Birds			
Roseate tern (*Sterna dougalli)*	Endangered	N/A	May affect but is not likely to adversely affect
Piping plover (*Charadrius melodus)*	Threatened	No	May affect but is not likely to adversely affect
Plants			
Seabeach amaranth (*Amaranthus pumilus)*	Threatened	N/A	May affect is but not likely to adversely affect

Sources: FWS County Lists for Kings and Queens Counties, New York; letter from NOAA Fisheries; and Transco's Request for an IHA, which is provided in Appendix N.

[a] N/A – No critical habitat has been designated for these species.

[b] Marine mammals, which are protected under the Marine Mammal Protection Act, are also discussed in Section 4.5.2.2 and in Transco's Request for an IHA, which is provided in Appendix N. Listed marine mammal species are afforded protected under both the Marine Mammal Protection Act and the Endangered Species Act.

[c] DPS – distinct population segment. A DPS is defined as a vertebrate population or group of populations that is discrete from other populations of the species and significant in relation to the entire species (NOAA Fisheries, n.d. [a]).

Northeast Connector Project

For the Northeast Connector Project, Transco reviewed lists of federally listed threatened and endangered species for York County, Pennsylvania (Compressor Station 195) and Mercer and Middlesex Counties, New Jersey (Compressor Stations 205 and 207). Based on this review and our own analysis, we determined that three federally listed species may be found in these areas. No critical habitat for any of these species occurs in the vicinity of the compressor stations. Our analysis of the potential for the Northeast Connector Project to impact the three federally listed species and our determination of effect for each of these species are discussed in Section 4.7.2 and listed in Table 4.7-2.

TABLE 4.7-2
Federally Listed, Candidate, and Petitioned Species Potentially Occurring in the Northeast Connector Project Area

Species	Federal Status	Critical Habitat in Project Area [a]	Determination
Mammals [b]			
Indiana bat *(Myotis sodalis*)	Endangered	No	May affect but is not likely to adversely affect
Reptiles			
Bog turtle (*Clemmys muhlenbergii)*	Threatened	No	No effect
Plants			
Swamp pink (*Helonias bullata)*	Threatened	No	No effect

Sources: FWS County List for York County, Pennsylvania and Mercer and Middlesex Counties, New Jersey.
[a] N/A – No critical habitat has been designated for these species.

4.7.1 Federally Listed Species – Rockaway Project

The proposed Rockaway Delivery Lateral would cross 3.20 linear miles of habitat, most of which (2.86 linear miles) would be offshore. Onshore construction activities include those associated with the HDD installation of the pipeline at the shoreline, the tie-in to the National Grid pipeline on the Rockaway Peninsula, and construction of the M&R facility on Floyd Bennett Field. Additional details regarding these facilities and how and when they would be constructed are provided in Section 2.0.

Construction activities that may affect federally listed marine species include offshore excavation, vessel anchoring, pile driving, the HDD operation, accidental spills of construction-related fluids (e.g., oil, gasoline, or hydraulic fluids), withdrawal and discharge of hydrostatic test water, and vessel traffic associated with construction and operation of the proposed facilities. Federally listed terrestrial species could be affected by some of these same activities as well as by the temporary removal of vegetation in construction areas. No federally listed terrestrial species are reported for Kings County, New York. Therefore, potential effects of the Rockaway Project on federally listed terrestrial species would be limited to the proposed activities at the HDD entry site and the tie-in to the National Grid pipeline on the Rockaway Peninsula. No federally listed species would be affected by construction or operation of the M&R facility, including rehabilitation of the hangar complex, at Floyd Bennett Field.

4.7.1.1 Marine Mammals

Fin Whale

The fin whale is a federally listed and New York State-listed endangered species (NOAA Fisheries, 2012a; NYSDEC, 2013c) comprised of two distinct sub-subspecies found in the Atlantic

Ocean. Fin whale occurring in waters along the east coast of the United States is from the western North Atlantic stock (Waring et al., 2012). Fin whale is the most common large whale species observed in U.S. waters from Cape Hatteras, North Carolina, northward (Cetacean and Turtle Assessment Program [CeTap], 1982). Historically, commercial whaling was the most prominent threat to fin whales. Currently, fin whales are the most often reported large whale to be hit by vessels (NOAA Fisheries, 2012a). Other threats to fin whale include entanglement in fishing gear, reduced prey abundance, habitat degradation, and disturbance by low frequency noise (NOAA Fisheries, 2012a). More detailed information regarding the fin whale and western North Atlantic stock is provided in Appendix N.

No critical habitat has been designated for the western North Atlantic fin whale stock (NOAA Fisheries, 2012a), but fin whales have been recorded aggregating in areas to the east and north of Cape Cod during the spring and summer months, and within the vicinity of the Delaware Bay/Delaware Peninsula during winter and spring (CeTap, 1982). Fin whales have been observed in waters south of Long Island, most commonly off of the eastern end of the island, but some sightings have occurred off northern New Jersey (CeTap, 1982). Between 2005 and 2009, one stranding was reported in Newark Bay (Waring et al., 2012), and in 2012 a fin whale was reported stranded in Breezy Point, Queens (New York Times, December 26, 2012), but there have been no reported observations of a fin whale in the vicinity of the Rockaway Delivery Lateral in recent years (Ocean Biological Information System – Spatial Ecological Analysis of Megavertebrate Populations (OBIS-Seamap), 2013).

Based on the documented occurrence information, sparse stranding records, and the preference of fin whales for deeper offshore waters, it is expected that the fin whale would not occur in the area near the Rockaway Delivery Lateral. Consequently, we conclude that the Rockaway Project would have *no effect* on fin whale.

Humpback Whale

The humpback whale is a federally listed and New York State-listed (NOAA Fisheries, 2013; NYSDEC, 2013d) endangered species. The humpback whale is a global species that can be found in all major oceans of the world. In the western North Atlantic, humpback whales can be found throughout the eastern coast of the United States throughout the year. Humpback whales that feed in the Gulf of Maine have been designated as a separate stock due to their strong site fidelity (Waring et al., 2012). Globally, threats to Humpback whales include entanglement in fishing gear, collisions with vessels, harassment by whale watching boats, degradation to habitats, and harvest (NOAA Fisheries 2013). More detailed information regarding the Humpback whale and western Gulf of Maine stock is provided in Appendix N.

No critical habitat has been designated for the Gulf of Main humpback whale stock (NOAA Fisheries, 2013d). Between 2005 and 2010, humpback whales were reported in confirmed human-caused mortality or serious injury offshore in New York and northern New Jersey waters (Waring et al., 2012). In April 2012, one humpback whale was reported stranded along the Long Island coast (Riverhead Foundation for Marine Research and Preservation, 2010), but in general, the presence of humpback whales near the southern shore of Long Island is rare. There have been no reported observations of humpback whale in the vicinity of the Rockaway Delivery Lateral in recent years (OBIS-Seamap, 2013). This lack of presence within the vicinity of the Rockaway Delivery Lateral indicates that this species is unlikely to be present in the vicinity of the proposed pipeline during construction. As such, we conclude that the Rockaway Project would have *no effect* on humpback whale.

North Atlantic Right Whale

The North Atlantic right whale (hereafter referred to as right whale) is a federally listed and New York state-listed endangered species (NOAA Fisheries, 2011a). Although recent data has suggested a

slight positive trend in population size (Waring et al., 2011), the right whale is considered one of the most critically endangered large whale populations in the world. Two of the biggest threats to the right whale are interactions with vessels and entanglement in fishing gear (Knowlton and Kraus, 2001; Waring et al., 2011). Other threats include habitat degradation, contaminants and pollutants, climate and ecosystem change, low frequency sounds made by humans, and natural predation by large sharks or killer whales (NOAA Fisheries, 2012b; Parks et al., 2007). More detailed information regarding the right whale is provided in Appendix N.

No critical habitat for the right whale has been identified within the waters off southern Long Island, but the route for the proposed pipeline is located on the periphery of a Seasonal Management Area (SMA) associated with the Port of New Jersey and New York (NOAA Fisheries, 2012e). The location of this SMA is shown on Figure 4.7.1-1. SMA boundaries are designated within a 20 nautical mile radius of major ports along the east coast of the United States and are in effect from November to April to protect right whales from interactions with vessels during migration. According to the NOAA Fisheries Northeast Fisheries Science Center (NEFSC) – North Atlantic Right Whale Sighting Survey, three right whales were detected in the vicinity of the Rockaway Delivery Lateral between 2007 and 2013 (NEFSC, 2013). Based on this survey, we conclude that right whales could be observed within the vicinity of the proposed pipeline during migration (generally November through April but potentially continuing into the summer). Given the infrequency of past sightings, the chance of a right whale occurring in the vicinity of the proposed pipeline during construction is low, but higher than that of the fin or humpback whales.

Potential Project Effects

Construction activities that could adversely affect right whales include noise generated by the pile driving of the HDD goal posts and other piles with a vibratory hammer; vessel traffic and noise; and waste including trash, debris, and spills. Since the bottom disturbance and hydrostatic test water withdrawal and discharge activities would be localized, these construction activities would not be expected to adversely affect right whales.

Underwater Noise Associated with Pile Driving

Transco provided information regarding the estimated noise that would be generated by pile driving during construction (ICF Jones & Stokes and Illingworth & Rodkin, Inc., 2009). The current thresholds for determining acoustic impacts on marine mammals, as well as fish and sea turtles, are presented in Table 4.5.2-1 in Section 4.5.

The hearing ranges identified for large open ocean whales are based on the assumption that the sound production range of the species is an indicator of their hearing range (Richardson et al., 1995; Ketten, 1998). Based on functional hearing models, whales may detect sounds as low as 20 hertz (Hz), with a range of lowest sensitivity at 20 to 50 Hz (NOAA Fisheries Northeast Region, 2010a). Right whales have been recorded producing tonal sounds between 20 and 1,000 Hz (Parks & Tyack, 2005) as well as vocalizations recorded in the 20 to 200 Hz range (Mellinger, 2004). Right whales have also been recorded producing sounds called “moans” at less than 400 Hz (Watkins and Schevill, 1972) and “gunshots” with the dominant frequencies ranging from 50 to 2,000 Hz (Parks et al., 2005).

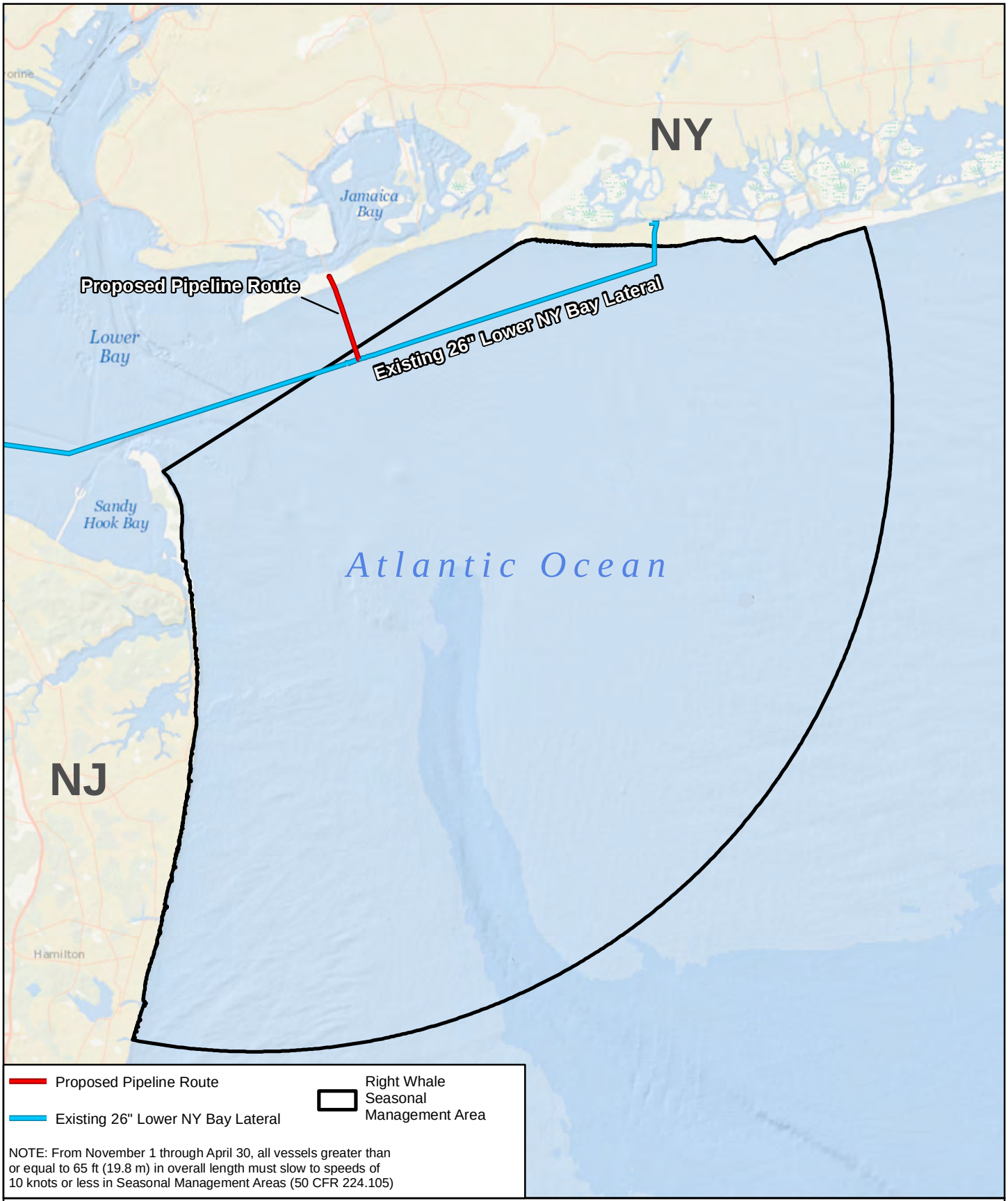

Figure 4.7.1-1
Rockaway Delivery Lateral
and Northeast Connector Projects
Right Whale Seasonal Management Area
in the Vicinity of the Rockaway Delivery Lateral

As described in Section 2.3.1.4, Transco would install (and remove) 70 piles in the offshore area using a vibratory hammer. Although there would be two vibratory hammers on-site, they would not be operated at the same time (one hammer would be in the process of positioning while the other is pile driving). We calculated the noise resulting from driving piles measuring 14 to 16 inches in diameter as 175 dB re 1 µPa RMS at 3.3 feet from the source using data provided by Transco (see Table 4.5.2-1). Whales could be injured by noise levels in excess of 180 dB re 1 µPa RMS and may react to noise levels at or above 120 dB re 1 µPa RMS (Richardson et al., 1995).

Based on the noise analysis provided above, we conclude that right whales would not be injured by pile driving, but noise from the vibratory hammer would exceed the behavior disturbance threshold for cetaceans and could disturb right whales within 2.86 miles of the pile driving activities. We have added a recommendation in Section 4.5.2.1 that Transco file a noise monitoring and mitigation plan to ensure that actual noise is consistent with the predicted values and/or to reduce the noise to acceptable levels.

As discussed in Section 4.5.2.2, the vibratory hammer would generate noise for a relatively short period of time. Transco estimates that it would take about 60 seconds of continuous driving to install each individual pile, and that all the piles would be installed over a period of approximately 10 days. The total operating time of the vibratory hammer for extraction of the piles at the end of the construction period is expected to be similar to the installation time. Based on the proximity of the Rockaway Delivery Lateral to the Port of New York and New Jersey and shipping traffic throughout the region, it is possible that the noise generated by pile driving would not be audible by right whales above existing ambient levels. Regardless, to mitigate the potential to disturb right whales due to sound generated from the vibratory hammer during pile driving, Transco would implement the following measures during construction:

- verifying the extent of the zone of influence (i.e., the area extending up to 3.0 miles from pile driving activities as shown in Figure 4.5.2-2) using a range finder or hand-held GPS device;

- using soft-start procedures before the start of each pile-driving session. Transco would operate the vibratory hammer for 15 seconds at 40 to 60 percent reduced power, followed by a 60 second waiting period to encourage species to leave or avoid the area. This procedure would be repeated two additional times before the vibratory hammer is operated at full power for pile driving;

- deploying NOAA Fisheries-approved observers to monitor for marine mammals within the zone of influence beginning 30 minutes before and ending 30 minutes after any pile driving activity;

- stationing two NOAA Fisheries-approved observers on the escort boat, which would be located approximately 1.5 miles from the active pile driving to monitor 360 degrees around the vessel (i.e., between the pile driving and the vessel and from the vessel out to the extent of the zone of influence). The observers would visually monitor the zone of influence using binoculars or other observation devices;

- conducting pile-driving activities when lighting and weather conditions allow the two NOAA Fisheries-approved observers to visually monitor the entire zone of influence. In the event that fog or poor lighting conditions develop while pile driving activities are occurring, the pile driving would be shut down until the entire zone of influence could be monitored by the observers;

- documenting sightings of marine mammals, including right whale, within the zone of influence and monitoring the animals for any abnormal behaviors (e.g., aggressive behavior, avoidance of the sound source, or an obvious startle response) displayed while vibratory pile driving is occurring or shortly after the pile driving has ended;

- shutting down the vibratory hammer if abnormal behaviors by a right whale (or other marine mammal) are observed within the zone of influence until the animal leaves the zone of influence; and

- recording information during each observation of a right whale (or other marine mammal), including the behavior of the animal, the number of individuals observed, the frequency of observation, the activity of the vibratory hammer at the time of the observation (e.g., pre-pile driving, soft-start, active pile-driving, or post-pile driving), and the reaction of the animal to the pile-driving activity.

As discussed in Section 4.5.2.2, Transco would provide NOAA Fisheries with a draft monitoring report within 90 days after the conclusion of the monitoring.

Vessel and Other Noise

Underwater noise associated with vessels is attributed to the low frequency noise created by the reverberation of their engines and propellers. Documented reactions of marine mammals to vessel noise include indifference, temporary change in breathing patterns, temporarily altered course, change in swimming speed when encountered by a smaller vessel, and overall avoidance of the vessel (Nowacek et al., 2001; Nowacek et al., 2007; Richardson et al., 1995).

As discussed in Section 4.5.2.1, the proposed Rockaway Delivery Lateral is located in the precautionary area of shipping lanes associated with the Port of New York and New Jersey, which is the largest port on the east coast of the United States. Based on the proximity of the pipeline route to this major shipping center, the background noise is likely dominated by large vessels (e.g., container ships) that produce source levels of 180 to 190 dB re 1 µPa RMS at frequencies between 200 and 500 Hz (Thomsen et al., 2009; Jasney et al., 2005). Therefore, the background noise in the underwater environment is likely similar to the noise that would be generated by the largest vessels that would be used during construction of the pipeline. As such, we do not expect that the small number of vessels associated with the Rockaway Project would have any significant effect on the existing underwater noise environment or marine species. Therefore, we do not expect vessel noise would adversely affect right whales.

Transco would conduct a post-installation hydrographic survey to document seafloor elevations along the pipe trench and other offshore excavation areas using a multi-beam echo sounder and side-scan sonar, both of which are considered pulsed noise sources. As discussed in Section 4.5.2.2, operating frequencies for this equipment (240 kilohertz or greater for echo sounders and a range of 445 to 900 kilohertz for side-scan sonar) are outside the functional hearing range for right whales. Therefore, the sound associated with the post-installation hydrographic survey would not affect right whales.

Vessel Traffic

The Rockaway Project is not expected to generate a large amount of vessel traffic. The crew and escort boats would make daily trips between the shore and the offshore construction site. The pipe transport barges (and the four tug boats that support them) would travel between the pipe yard and the offshore construction site once per day during pipe laying activities, where one barge would be loaded at

the pipe yard while the other would be used at the offshore work site. The dive support vessel could make daily trips to and from the work area if it docks in the harbor at night, but the vessel would be capable of anchoring in the work area overnight. The fuel barge (and the tug boats that supports it) would make about one trip per week to the work area to refuel vessels and equipment. The other vessels, including the clamshell barge, jack-up barge, and pipe lay barge (and associated tug boats) would remain at the offshore construction area for the duration of their work. While on-site, construction vessels would not be running and would either be anchored, lifted above the water, or moved by their tug boats. Additional information on vessel traffic is provided in Section 4.8.4.2.

Transco would monitor right whale sighting reports during construction to remain informed on the whereabouts of right whales in the vicinity of the Rockaway Delivery Lateral. As discussed in Section 4.5.2.2, Transco would have NOAA Fisheries-approved observers to monitor for protected species and maintain a watch for marine mammals, including right whales. Vessels associated with pipeline construction would comply with vessel speed restrictions, approach/distance restrictions, and observer/lookout protocols required by NOAA Fisheries (see Attachment 1 to Appendix N), including regulations prohibiting the approach of right whales closer than 500 yards (1,500 feet). Additionally, Transco has stated that any construction vessels measuring 65 feet in length or greater would travel at speeds no greater than 10 knots (11.5 miles per hour) while traveling within seasonal management areas for whales along the east coast. With Transco's implementation of these measures, vessel traffic is not expected to affect right whales.

Bottom Disturbance

Bottom-disturbance effects such as turbidity, sedimentation, or physical alteration of bottom sediments are not expected to affect right whales because the species is not known to feed in the area of the proposed pipeline and would be migrating through the region. Therefore, the proposed disturbance of sediments associated with trenching and other excavations is not expected to affect right whales.

Hydrostatic Test Water Withdrawal and Discharge

Withdrawal or discharge of seawater used during hydrostatic testing is not expected to affect transiting right whales or right whale foraging. As discussed in Section 4.6.3.2, water withdrawals could impinge juvenile and early stage adult fish and invertebrates and entrain or entrap zooplankton, including copepods, which are a food source for right whales. The resulting loss of organisms due to water withdrawals would not be expected to impact whales because only a small volume of water would be withdrawn relative to the total volume of water within the New York Bight area. As a result, the number of organisms impinged or entrained as a result of hydrostatic testing would be small. Additionally, there are no known whale feeding locations in the vicinity of the Rockaway Delivery Lateral.

Use of the oxygen scavenger, biocide, and fluorescent dye in the hydrostatic test water would not impact whales. As discussed in Section 4.6.3.2, available data on the toxicity of the active ingredients in these compounds concludes that they would not be toxic to marine species at the expected concentrations during the time of discharge. Moreover, the hydrostatic test water would be discharged to the marine environment through a multi-port diffuser, which would dilute the concentrations at a rate of 15:1. Therefore, hydrostatic testing is not expected to affect right whales.

Trash, Debris, and Spills

Waste, such as bilge and ballast water, trash, debris, and sanitary and domestic waste, would accumulate on vessels during construction. The vessels would adhere to the USCG marine trash policy and the SPCC Plan (see Appendix F) to minimize the potential for right whales to be exposed to these

wastes and avoid right whale entanglements or ingestion of marine debris or pollutants. As noted elsewhere, Transco's SPCC Plan does not identify emergency response procedures for offshore spills, but we have added a recommendation in Section 4.3.2.3 that Transco file an updated plan that includes specific measures that would be implemented to identify, control, and clean up any accidental leaks or spills from offshore construction vessels.

Right Whale Conclusions

The potential effects of the Rockaway Project on right whales would be limited primarily to noise associated with the installation and removal of piles (e.g., HDD goal posts and fender piles) with the vibratory hammer. We consider the risk of this activity to be low due to the low probability of a whale transiting near the area when construction is in progress. The risk of effects would be reduced further by Transco's various mitigation measures, including using NOAA Fisheries-approved observers and soft-start procedures prior to each pile driving session. Additionally, we have added a recommendation in Section 4.5.2.1 that Transco file a noise monitoring and mitigation plan to ensure that actual noise is consistent with predicted values and/or to reduce the noise to acceptable levels.

As discussed in Section 4.5.2.2, Transco included the right whale in its request to NOAA Fisheries for an IHA. Specifically, based on a calculated likelihood of right whale being present, Transco requested a Level B harassment take authorization for one right whale. We have been advised by NOAA Fisheries that a take under the MMPA would also require a take under the ESA. Therefore, we have determined that the Rockaway Project *may affect and is likely to adversely affect* the right whale. We have added a recommendation in Section 4.7.4 that Transco should defer construction until we have received NOAA Fisheries comments on Transco's proposed mitigation measures and request for an IHA, formal consultation (if required) has been completed, and the Director of OEP has approved Transco's plans.

4.7.1.2 Fish

Atlantic Sturgeon

The Atlantic sturgeon is a subtropical species that can be found along the Atlantic coast from Labrador, Canada to Florida (Murdy et al., 1997). Atlantic sturgeon numbers historically were depleted by fishing and other causes (Atlantic Sturgeon Status Review Team [ASSRT], 2007). Although fishing is now banned, other threats remain including habitat degradation, vessel strikes, anthropogenic noise, and accidental capture, injury, and mortality in fisheries (NOAA Fisheries, 2012d). No critical habitat has been designated for the Atlantic sturgeon.

The Atlantic sturgeon can be found in 32 rivers along the Atlantic coast, at least 20 of which are known to be spawning rivers (NOAA Fisheries, 2012d). Five DPS of Atlantic sturgeon have been identified based on the marked differences in physical, genetic, and physiological factors within the species. Also important to the distinction are the unique ecological settings and marked differences in genetic characteristics which, if lost due to the extinction of one or more DPS, would leave a significant gap in the range of the taxon (ASSRT, 2007). The five DPS of Atlantic sturgeon (i.e., the New York Bight, Gulf of Maine, Chesapeake Bay, Carolina, and South Atlantic DPS) are grouped by ranges according to designations published by NOAA Fisheries on February 6, 2012.

The New York Bight DPS is federally endangered and includes all anadromous Atlantic sturgeon that are spawned in the watersheds that drain into coastal waters from Chatham, Massachusetts to the Delaware-Maryland border on Fenwick Island, Delaware. Within this range, Atlantic sturgeon have been documented from the Hudson and Delaware Rivers as well as at the mouth of the Connecticut and Taunton Rivers, and throughout Long Island Sound (77 Federal Regulations [FR] 5880).

The Gulf of Maine DPS is listed as federally threatened and includes all anadromous Atlantic sturgeon that are spawned in the watersheds from the Maine/Canadian border, and extending southward to include all associated watersheds draining into the Gulf of Maine as far south as Chatham, Massachusetts. Within this range, Atlantic sturgeon has been documented in the Penobscot, Kennebec, Androscoggin, Sheepscot, Saco, Piscataqua, Presumpscott, and Merrimac Rivers (77 FR 5880).

The Chesapeake Bay DPS is listed as federally endangered and includes all anadromous Atlantic sturgeon that are spawned in the watersheds that drain into the Chesapeake Bay and into coastal waters from the Delaware-Maryland border on Fenwick Island to Cape Henry, Virginia. Within this range, Atlantic sturgeon have been documented from the James, York, Potomac, Rappahannock, Pocomoke, Choptank, Little Choptank, Patapsco, Nanticoke, Honga, and South Rivers as well as the Susquehanna Flats (77 FR 5008).

The Carolina DPS is listed as federally endangered and includes all Atlantic sturgeon that are spawned in the watersheds along the southern Virginia, North Carolina, and South Carolina coastal areas to Charleston Harbor (77 FR 5914).

The South Atlantic DPS is listed as federally endangered and includes all Atlantic sturgeon spawned in the watersheds (including all rivers and tributaries) of the Ashepoo, Combahee, and Edisto Basin southward along the South Carolina, Georgia, and Florida coastal areas to the St. Johns River in Florida (77 FR 5914).

Aggregations of the New York Bight DPS are closest to the Rockaway Delivery Lateral, with spawning populations found in the Hudson and Delaware Rivers, but the marine range of the other four DPS also overlaps this area (77 FR 5880; 77 FR 5914). Consequently, any of the five DPS could occur in the New York Bight (Dunton and Frisk, 2012).

The NYSDEC reported higher catches of Atlantic sturgeon along the 33-foot depth contour off the south shore of Long Island from the New York Bight to Montauk, New York (Laney et al., 2007). This included a sturgeon aggregation area around the 33-foot depth contour between the Rockaway and East Rockaway inlets, in the vicinity of the proposed pipeline (see Figure 4.5.1-1 in Section 4.5).

Based on two separate New York State bottom trawl surveys completed between 2005 and 2007, Dunton et al. (2010) found that 85 percent of the captured Atlantic sturgeon was caught at depths between 16 to 33 feet and 50 percent were captured in the region surrounding the mouth of the Hudson River, particularly near the Rockaway Peninsula. A subsequent study found that the number of Atlantic sturgeon within the Rockaway region typically peaks between April and June and consists of mostly juveniles. The fish appear to remain in the area for about 2 months, after which time the numbers decline. A smaller aggregation of Atlantic sturgeon returns to the area during the fall (between September and November) (Dunton and Frisk, 2012).

The available information suggests that Atlantic sturgeon would likely be present in higher numbers in the vicinity of the Rockaway Delivery Lateral during the spring (April to June) and fall (September to November). During these times, the majority of the Atlantic sturgeon in the area would be juveniles. We can conclude from this and the offshore construction schedule that construction activities and Atlantic sturgeon aggregations may coincide in the spring and fall.

Potential Project Effects

Construction activities that could adversely affect Atlantic sturgeon include underwater noise, vessel traffic, bottom disturbance, hydrostatic testing, and exposure to waste, including trash, debris, and spills.

Underwater Noise

The amount of information regarding impacts on fish from manmade acoustic sources is limited. The acoustic threshold criteria for injury to fish were developed by the Fisheries Hydroacoustic Working Group (FHWG) in 2008. These criteria were based around impacts from pile driving but were assumed to be suitable for use in association with other sound sources. The threshold for potential injury for all fish species is based on the following dual criteria: peak sound pressure level (SPL) of 206 dB re 1 µPa, and a CSEL of 187 dB re 1 μPa^2-sec for fish weighing 2 grams or more or a CSEL of 183 dB re 1 μPa^2-sec for fish weighing less than 2 grams (Fisheries Habitat Working Group, 2008). To assess behavioral disturbance, NOAA Fisheries has adopted a threshold criterion of 150 dB re 1 µPa RMS for fish of all sizes (Anderson et al., 2007; Purser and Radford, 2011; Wysocki et al., 2007; Palmer, 2012).

Like marine mammals, fish can be affected by noise both physiologically and behaviorally. The Atlantic sturgeon is a hearing generalist and uses particle motion to detect sounds (Lovell et al., 2005). Fish with swim bladders, such as the Atlantic sturgeon, are considered to be more vulnerable to noise which can rapidly expand and contract the swim bladder, and rupture capillaries (California Department of Transportation, 2001). Tissue damage may occur as a result of exposure to such sounds (Popper and Hastings, 2009). Previous pile driving projects have reported fish mortality related to impact pile driving involving 8-foot-diameter steel pipe piles, although other projects involving smaller diameter piles and caged salmon as close as 2 feet from the piles did not report any fish mortality (NOAA Fisheries Northeast Region, 2012b). It should be noted that the majority of research involved pile driving with an impact hammer. There is less information regarding the potential impacts of noise resulting from the use of vibratory hammers.

Based on the source and noise threshold levels reported in Table 4.5.2-1, we conclude that the noise generated by the vibratory hammer would exceed the injury and behavioral disturbance thresholds for Atlantic sturgeon, but within relatively short distances from the pile driving activity. Noise would exceed the injury threshold within distances of 7.1 feet for fish weighing 2 grams or more and 13.1 feet for fish weighing less than 2 grams (juvenile sturgeon would weigh more than 2 grams). Noise would exceed the behavioral disturbance threshold for fish within a distance of 151 feet from the pile driving activity. We have added a recommendation in Section 4.5.2.1 that Transco file a noise monitoring and mitigation plan to ensure that actual noise is consistent with the predicted values and/or to reduce the noise to acceptable levels.

Given the short distances predicted for noise impacts, and Transco's plan to implement soft-start procedures for the vibratory hammer, Atlantic sturgeon are likely to move away from the area before noise levels from the pile driving exceeds the injury and behavioral disturbance thresholds. Additionally, the installation and removal of the piles would occur over a relatively short period. Transco estimates that it would take about 60 seconds of continuous driving to install each individual pile, and that all the piles would be installed over a period of approximately 10 days. The total operating time of the vibratory hammer for extraction of the piles at the end of the construction period is estimated to be similar to the installation time.

Benthic sampling indicates that Atlantic sturgeon forage for species such as Atlantic surf clams, which are present in the vicinity of the proposed Rockaway Delivery Lateral. While noise levels exceeding 150 dB re 1 µPa RMS may cause the Atlantic sturgeon to avoid the immediate area, the sturgeon would not be permanently deterred from foraging in the affected area for the following reasons: the pile driving would occur over a relatively short amount of time, the area of disturbance surrounding each pile would be small, and other nearby foraging habitats would be available. It is possible that sturgeon could be attracted to the construction area for foraging purposes if prey items are stirred up from the bottom during pile driving. In this case, Atlantic sturgeon could possibly remain within the area of acoustic behavioral disturbance during the pile driving.

Noise from construction vessels (which is not expected to exceed 180 dB re 1 µPa RMS for the largest vessels) could potentially disturb Atlantic sturgeon but the response of the sturgeon to this noise would be similar to the response described for vibratory pile driving activities, albeit within a slightly larger area. Vessel noise typically would be limited to the few vessels making daily or routine trips to the offshore construction area, or vessels, such as tugs, positioning other equipment. The larger construction vessels, such as the clamshell barge, jack-up barge, and pipe lay barge, typically would not be running and would either be anchored, lifted above the water, or moved by their tug boats. As such, we conclude that while vessel noise may disturb Atlantic sturgeon, these disturbances would not result in mortality.

In conclusion, the potential effects on Atlantic sturgeon associated with noise from pile driving and vessels would be limited based on the low level of sound produced, the limited area where noise would exceed injury or behavioral disturbance thresholds, and the short time frame of the activities. Sturgeon behavior may be temporarily affected close to the pile driving and vessels, but the effort to avoid these relatively small areas would not require a large expense of extra energy by the sturgeon. Therefore, the noise generated by the Rockaway Project is not expected to significantly affect Atlantic sturgeon.

As discussed above, Transco would conduct a post-installation hydrographic survey to document seafloor elevations along the pipe trench and other offshore excavation areas using a multi-beam echo sounder and side-scan sonar. Operating frequencies for this equipment are outside the hearing range for Atlantic sturgeon. Therefore, the sound associated with the post-installation hydrographic survey would not affect Atlantic sturgeon.

Vessel Traffic

Construction activities are not expected to generate a large amount of increased vessel traffic in the vicinity of the Rockaway Delivery Lateral. Construction vessels such as the clamshell barge, jack-up barge, and pipe lay barge (and associated tug boats) would remain at the offshore site throughout construction and would be stationary or traveling at slow speeds. The vessels transiting daily or weekly would be much smaller and would be spending limited time within the narrower waterways of the Arthur Kill, Kill Van Kull, and Narrows between Staten Island and Brooklyn. The remainder of the time, vessels would be offshore where the width and depth of the waterway would not be constrained. Additional information on expected vessel traffic for the Rockaway Project is provided in Section 4.8.4.2.

Factors relevant to determining the risk to Atlantic sturgeon from vessel strikes are currently unknown, but may be related to the size and speed of vessels, navigational clearance (i.e., depth of water and draft of vessels), and the behavior of Atlantic sturgeon (e.g., foraging, migrating, etc.) in areas where vessels are operating (NOAA Fisheries Northeast Region, 2013a). Large vessels have been implicated because of their deep draft (up to 40 to 45 feet) relative to smaller vessels (about 15 feet), which increases the probability of vessel collisions with demersal fishes like sturgeon, even in deep water (Brown and Murphy, 2010). Smaller vessels and those with relatively shallow drafts provide more clearance with the bottom which reduces the probability of strikes. Because offshore construction vessels (e.g., tug boats, barge cranes, and hopper scows) have relatively shallow drafts, the chances of vessel-related mortalities are reduced. It is also important to note that vessel strikes have only been identified as a significant concern in the Delaware and James Rivers. Current data suggests that there may be unique geographic features (e.g., narrow migration corridors combined with shallow/narrow river channels) that increases the risk of interactions in these areas between vessels and Atlantic sturgeon (NOAA Fisheries Northeast Region, 2013a).

Construction of the Rockaway Project would result in an increase in vessel traffic, but the effect would be small and localized relative to existing traffic into and out of the Port of New Jersey and New York. Traffic under the Tappan Zee Bridge between 2000 and 2008, for example, ranged from 8,000 to

16,000 large vessels per year, but this number excluded small recreational boats, for which no data are available (NOAA Fisheries Northeast Region, 2013a). As a result, actual vessel traffic under the bridge was likely much higher. As discussed above, many of the construction vessels associated with the Rockaway Project (e.g., the pipe lay barge and jack-up barge) would remain in the offshore construction area while they are deployed. Only the crew and escort boats, the pipe transport barges and associated tugs, and possibly the dive support vessels, would make daily trips to the offshore construction area.

While the area off Rockaway Beach is a known sturgeon aggregation area, the species remains near the seafloor when foraging and would not likely come into contact with construction vessels at these times. Sturgeon could be found in the water column when migrating through the area, but the depth of water in the construction work area (30 to 50 feet), the resulting navigational clearance, and the slow movement of transiting vessels would limit the potential for vessel strikes on migrating sturgeon. A similar conclusion was reached in a recent BO issued by NOAA Fisheries (2013) regarding the potential impacts of construction vessel traffic on Atlantic and shortnose sturgeon for the Tappan Zee Bridge Replacement Project. NOAA Fisheries concluded in the BO that the effects to Atlantic and shortnose sturgeon from vessel traffic would likely to be discountable. For all these reasons, vessel traffic associated with the Rockaway Project is not expected to affect Atlantic sturgeon.

Bottom Disturbance

Turbidity is not expected to affect Atlantic sturgeon. Juvenile and adult Atlantic sturgeon are frequently found in turbid water and are capable of avoiding sediment plumes by swimming higher in the water column (NOAA Fisheries Northeast Region, 2012b). Laboratory studies (e.g., Niklitschek, 2001 and Secor and Niklitschek, 2001) have demonstrated that shortnose sturgeon are able to avoid areas with unfavorable water quality conditions and that they seek out more favorable conditions when available. This behavior has also been observed in Atlantic sturgeon (NOAA Fisheries Northeast Region, 2012b).

While an increase in suspended sediments may cause sturgeon to alter their normal movements, any change in behavior is likely to be insignificant involving movement further up in the water column or around the plume. Based on this information, any increase in suspended sediment due to construction of the Rockaway Delivery Lateral would not likely affect the movement of sturgeon between foraging or concentration areas during any phase of dredging or jetting or otherwise negatively affect sturgeon. Additionally, as stated above, it is expected that the turbidity plumes created by the jet sled and other equipment would be localized and temporary (lasting no more than 3.0 hours following the activity), and would have a minimal and short-term impact on the substrate and the water column within the area.

Because Atlantic sturgeon is a bottom feeder, it may be at risk of injury or mortality from direct interactions with the clamshell dredge, jet sled, hand jets, or suction dredge, which would be operated on the seafloor. In addition, Transco's planned construction schedule would overlap with the period when Atlantic sturgeon numbers are at their peak.

There have been no direct studies addressing the interactions between Atlantic sturgeon and jet sleds, hand jets, clamshell dredges, or suction dredges, and we are unaware of any reported interactions between sturgeons and jetting or suction dredging operations. In 2012, the USACE provided NOAA Fisheries with a list of all documented interactions between mechanical dredges and sturgeon reported along the east coast of the U.S. from as far back as 1990 (USACE 2012). This report identified four incidences of sturgeon being captured in dredge buckets. One of these was in the Cape Fear River and the other three were at the Bath Iron Works facility in the Kennebec River, Maine.

The risk of interactions between sturgeon and dredges is thought to be highest in areas where sturgeon are known to aggregate, such as overwintering sites or foraging concentrations (NOAA Fisheries Northeast Region, 2013a). The Bath Iron Works facility, where 75 percent of recorded interactions

between sturgeon and bucket dredges have occurred, is in an area where foraging sturgeon are known to aggregate in the summer months. This suggests the risk of capture may be related to the behavior of sturgeon in the area. While foraging, for example, sturgeon are at the bottom of the river interacting with the sediment; this behavior may increase the susceptibility of sturgeon to capture in a dredge bucket (NOAA Fisheries Northeast Region, 2013a).

Atlantic sturgeon does not appear to display a fear response, so sturgeon in the path of the jet sled, clamshell dredge bucket, or suction dredge during construction of the Rockaway Project may not be sufficiently disturbed to move away (Dunton and Frisk, 2012). Further, the jetting and dredging may stir up benthic prey items buried within sediments that could attract Atlantic sturgeon to the area while equipment is operating. This could increase the potential for direct interaction between the jetting and dredging equipment with individual Atlantic sturgeon. There may also be a risk of impingement of sturgeon on the intakes of jetting and dredging equipment, although we are unaware of any studies which have documented such an occurrence using equipment similar to what would be used for the Rockaway Delivery Lateral.

Based on the above discussions, interactions between Atlantic sturgeon and construction equipment are possible, though the likelihood of interactions would be reduced by the short duration of the jetting and dredging activities. It would take about 10 days for the dredging of the HDD pit, 8 days to complete the excavations along the pipeline centerline with the jet sled, 2 to 4 days for each hand-jetting activity, and up to 15 days for suction dredging. In the event of an interaction, we do not expect that Atlantic sturgeon would be at serious risk of injury or mortality from these activities due to the slow rates of movement of the dredging and jetting equipment. The jet sled and suction dredge, for example, are expected to advance at rates of 200 to 400 feet per hour and 100 feet per hour, respectively. Hand-jetting activities would be diver-assisted and would occur at a slower rate than jet sledding. Divers would be instructed on the importance of avoiding impacts on sturgeon and would report any observed sturgeon. Therefore, hand jetting is not expected to significantly affect sturgeon.

There is potential for Atlantic sturgeon to be impinged on the suction dredge during backfilling. This risk would be mitigated through the use of a turtle screen (half-inch rebar in 5-inch squares) installed on the suction pan in the dredge. Impingement of Atlantic sturgeon on the intakes of jetting and dredging equipment seems unlikely due to the relatively low volumes of water used when compared to water intakes at nuclear facilities, where impingements of sturgeon have been documented (see more discussion of impingement at nuclear facilities in the discussion of hydrostatic testing below). For these reasons, we do not expect that the use of the suction dredge or other construction equipment with water intakes would significantly affect sturgeon.

Atlantic sturgeon prey includes crustaceans, marine worms, and bivalve shellfish, which are known to occur in the vicinity of the Rockaway Delivery Lateral. The benthic community within this area likely is similar to that of other shallow, sandy habitats in the New York Bight. Preliminary studies of stomach content samples show that the stomachs of Atlantic sturgeon are full while in the Rockaway area, indicating that this may be an important feeding ground for the sturgeon that aggregate at this location (Dunton and Frisk, 2012). Therefore, bottom-disturbing activities, such as use of the jet sled and dredges, could reduce the amount of important prey items for Atlantic sturgeon in the offshore work area. Trench excavation, turbidity, and re-deposition of sediments during construction may bury benthos, but the affected area would be only a small portion of the New York Bight (which encompasses about 31,276 square miles or over 20 million acres). Additionally, as described in Section 4.6.3.2, the benthic community is expected to recover quickly, probably within 1 to 2 years after construction. We have also added a recommendation in Section 4.6.3.2 that Transco file a post-construction benthic sampling and monitoring plan to ensure that benthic communities recover as expected.

Based on the short duration of construction and the rapid rate of benthic community recovery in the disturbed area, effects on Atlantic sturgeon prey assemblages would be short term. During and directly following construction, Atlantic sturgeon could continue feeding in the greater Rockaway region, including the area immediately surrounding the location of significant direct and indirect impact from construction. Additionally, the Rockaway Delivery Lateral would not permanently deter Atlantic sturgeon from returning to the area. Following recovery of the benthic assemblages, Atlantic sturgeon could resume feeding in the areas affected by construction.

Our conclusions regarding recovery and re-use of the affected areas are consistent with those of a recent BO issued by NOAA Fisheries (2013) for the Tappan Zee Bridge Replacement Project in New York City. This BO evaluated the effects of dredging on benthos and sturgeon foraging habitat. Similar to our analysis of the Rockaway Project, the BO concluded that the dredging footprint of the bridge replacement project represented a very small percentage of the bottom habitat within the region and that the temporary reduction of benthic fauna in the affected area would not substantially reduce foraging opportunities for sturgeon populations. The BO also concluded that once the in-water activities were completed, the dredged channels would be restored over time to their original elevations and the benthic community would recolonize those areas such that sturgeon would regain any lost foraging habitat.

In conclusion, bottom-disturbing activities such as dredging and jet-trenching would have the potential to affect Atlantic sturgeon by removing and disturbing their prey and by interaction with the clamshell dredge, jet sled, diver-directed hand-jets, and suction dredge. The area in the vicinity of the Rockaway Lateral may be an important foraging habitat for the Atlantic sturgeon, but it is not unique from the surrounding New York Bight region. Therefore, any sturgeon that may be deterred from feeding within the construction area could move to other nearby habitat to feed, so disturbance of foraging habitat would be minimal and temporary.

Hydrostatic Testing

Individual Atlantic sturgeon could be entrained or impinged during the intake of seawater for the hydrostatic tests, but this is unlikely. Impingement of sturgeon has been reported at intakes at nuclear power facilities. Specifically, NOAA Fisheries found relatively small numbers of impinged Atlantic sturgeon (average of 11.45 sturgeon per year from 2001 to 2008) on intakes for a nuclear facility with flow rates ranging from about 1 million to 1.8 million gallons per minute (NOAA Fisheries, 2013e). This is 250 to 450 times the anticipated intake rate for the Rockaway Project, which would use a total of approximately 573,500 gallons of water withdrawn at a rate of about 4,000 gallons per minute. Additionally, Transco would reduce the potential for impingement by positioning the water intakes approximately 20 feet below the surface. This would place the intakes between 10 and 30 feet off the seafloor depending on the location of the withdrawal activities. Transco would also use screens on the intakes to reduce the number of organisms entrained within the pipeline. Atlantic sturgeon larvae are approximately 0.3 inches (7.8 millimeters) in length at hatching, so it is unlikely that sturgeon would pass through the intake screen, which would have a mesh opening of 0.0029 inch (0.07 millimeter).

The potential for impingement of sturgeon is low due to the position of the intake off the seabed, the small area likely to be influenced by the intake, and the short, approximately 2 hour duration of the withdrawal operation. Additionally, healthy sturgeon are strong swimmers. Based on the study of sturgeon impingement at water intakes for the nuclear facility (NOAA Fisheries, 2013e), any Atlantic sturgeon near the intake for hydrostatic test water during construction of the Rockaway Delivery Lateral should be able to escape the flow of water into the intake given the slow rate of withdrawal.

The discharge of seawater and the use of an oxygen scavenger, biocide, and fluorescent dye in the hydrostatic test water is not be expected to affect Atlantic sturgeon. As discussed in Section 4.6.3.2, the acute toxicity of these additives is generally low, and in the case of the biocide, would degrade during the

30 days the water is held in the pipe. Additionally, the test water would be pumped through a multi-port diffuser before it is discharged (at a rate of 2,000 gallons per minute) back to the marine environment. This would re-oxygenate and mix the discharged water with the surrounding sea water thereby dispersing (diluting) at a rate of 15:1 the concentrations of the biocide and oxygen scavenger in the test water. The resulting concentrations of these additives are not expected to cause adverse effects on marine organisms (see Section 4.6.3.2 for additional discussion of the ecotoxicity of the biocide and oxygen scavenger).

Trash, Debris, and Spills

Atlantic sturgeon could potentially be exposed to operational waste or solid debris during construction, but this is unlikely because the offshore vessels would adhere to the USCG marine trash policy and the SPCC Plan (see Appendix F). While Transco's SPCC Plan does not identify emergency response procedures for offshore spills, we have added a recommendation in Section 4.3.2.3 that Transco file an updated plan that includes specific measures that would be implemented to identify, control, and clean up any accidental leaks or spills from offshore construction vessels.

Atlantic Sturgeon Conclusions

We conclude that Atlantic sturgeon from the New York Bight DPS is most likely to occur in the vicinity of the Rockaway Delivery Lateral, but sturgeons from other DPS also have the potential to occur in the area. Atlantic sturgeon occurrences within the Rockaway region typically peak between April and June and consist mostly of juveniles. A smaller aggregation of Atlantic sturgeon returns to the area during the fall (September to November). Therefore, some of the proposed offshore construction activities would occur when sturgeon numbers in the New York Bight are at their highest.

We conclude that vessel traffic associated with the Rockaway Project would not affect Atlantic sturgeon. It is also unlikely that Atlantic sturgeon would be injured by the noise of any construction activities associated with the Rockaway Project, but sturgeon may avoid areas close to the vibratory hammer and vessels when they are in operation. Additionally, as noted above, we have added a recommendation in Section 4.5.2.1 that Transco file a noise monitoring and mitigation plan to ensure that actual noise is consistent with predicted values and/or to reduce the noise to acceptable levels.

Bottom-disturbing activities such as dredging and jet-trenching have the potential to affect Atlantic sturgeon by removing and disturbing prey species, causing sturgeon that are deterred from feeding within the construction area to move to nearby unaffected areas. Sturgeon may also be affected by potential interactions with the clamshell dredge, jet sled, and other equipment. Although the equipment would move at slow speeds and would be operating on the seafloor for a limited period of time, there is the potential for impacts due to the aggregation of Atlantic sturgeon in the area at the time of construction.

Based on the analysis presented above, we conclude that the Rockaway Project *may affect, and is likely to adversely affect* the Atlantic sturgeon.

Shortnose Sturgeon

The shortnose sturgeon is a federally listed endangered species and state-listed endangered species in New York and New Jersey. It is a large, long-lived benthic-feeding, anadromous species that primarily inhabits slow-moving riverine, estuarine, and marine nearshore habitats. In New York, the shortnose sturgeon is found in the lower portion of the Hudson River from the southern tip of Manhattan to the Troy Dam (NYSDEC, 2013b). The most recent estimates using mark-recapture methods have suggested the population size in the Hudson River is above 60,000 individuals (Bain et al., 2007).

Shortnose sturgeon travel upriver to spawn (NOAA Fisheries, 2010). It has been reported that adults in the Hudson River occur in both freshwater and upper tidal saline areas all year. From late spring to early fall, the sturgeon are typically in the deep channels in freshwater and brackish habitats. In late fall, most adults congregate in a single wintering site (Bain et al., 2007), whereas young are found in freshwater throughout the year (NOAA Fisheries, 1998). Spawning begins in mid- to late-spring, when water temperatures increase to 46 to 48 degrees Fahrenheit (°F), and usually ends once temperatures reach 54 to 59 °F. Juveniles are typically found at the saltwater/freshwater interface, and move back and forth in the low salinity area during the summer. In the Hudson River, juveniles are usually found in channels over silt substrates (NOAA Fisheries, 1998).

Shortnose sturgeon are unlikely to be found in the ocean area off the Rockaway Peninsula, in the vicinity of the proposed pipe yard at Elizabeth Reach, or along the portions of the pipe transport route traversing the waters of Newark Bay, Kill Van Kull, Lower Bay, or the Atlantic Ocean. However, shortnose sturgeon may be present where the pipe transport route crosses the Upper Bay of New York Harbor. The pipe transport barges would make daily trips across the Upper Bay for the duration of pipe laying activities. Collisions between these vessels and shortnose sturgeon are possible, but unlikely. This is due to the depth of the water in the Upper Bay along the transit route (about 50 feet), which would provide ample room for fish to pass under the barges, and also by the slow movement of the transiting vessels. We additionally note that the Upper Bay is a heavily trafficked area associated with the Port of New Jersey and New York, so sturgeon in this area would be accustomed to vessel traffic. For these reasons, we conclude that the Rockaway Project *may affect, but is not likely to adversely affect* shortnose sturgeon.

4.7.1.3 Marine Turtles

Four sea turtle species were identified by NOAA Fisheries as having the potential to occur in the vicinity of the Rockaway Delivery Lateral: the leatherback, Kemp's Ridley, green, and loggerhead sea turtles. No critical habitat has been designated for any of these species in the vicinity of the proposed pipeline, nor has any of these species been known to nest in this area (FWS, 2012a-d; NOAA Fisheries, 2011b-e).

Leatherback

The leatherback is a federally listed endangered species throughout its range, which includes both the Atlantic and Pacific Oceans (NOAA Fisheries, 2012c; FWS, 2012d). Threats to leatherback turtles include harvest outside of the United States, incidental capture in fishing gear, and underwater noise generated by vessels and other human-related in-water activities (NOAA Fisheries, 2012c). Leatherbacks have been observed on the east coast from North Carolina to Nova Scotia with the greatest concentrations reported between Long Island and the Gulf of Maine. Concentrations of migrating leatherbacks have been observed south of central Long Island and to the east of New Jersey (Shoop and Kenney, 1992). Most sightings along Long Island have been towards the northern end of the island away from the Rockaway Project area (CeTAP, 1982). The waters south of Long Island are not expected to be important feeding habitat for leatherback sea turtles, but leatherbacks may feed in this area during migrations. Between 2008 and 2013, no stranding's of this species were reported in Queens County, New York (NOAA Fisheries Southeast Fisheries Science Center [SEFSC], 2013).

Because leatherbacks have been documented in the waters south of Long Island, we conclude that these sea turtles could potentially occur within the offshore construction area during the spring, summer, and fall (May through November).

Kemp's Ridley

The Kemp's ridley sea turtle is a federally listed endangered species (NOAA Fisheries, 2011d; FWS, 2012b). These sea turtles face threats similar to many other sea turtles including egg harvesting, incidental capture in fishing gear, and under water noise generated from human in-water activities (NOAA Fisheries, 2011c; NOAA Fisheries, 2011d). Kemp's ridley turtles commonly are encountered in New York waters and have been observed off the coast of Long Island (CeTAP, 1982; Morreale et al., 1992). Five strandings of Kemp's ridley turtles were reported in Queens County, New York between 2008 and 2013, with the earliest stranding reported in July (SEFSC, 2013). While the species is more commonly found within the Long Island Sound, we conclude that its presence in the offshore construction area is possible during the summer and fall months (May through early November).

Green

The green sea turtle is a federally listed endangered species, with a breeding population in the northeast Atlantic (NOAA Fisheries, 2011e). Threats to this species include commercial harvest, capture in fishing gear, and under water noise generated by in-water human activities (NOAA Fisheries, 2011e). Green sea turtles are found during summer months in the northern Atlantic where they typically feed in shallow waters abundant in algae or marine grass, and the species has been observed in the offshore construction area in this timeframe (CeTAP, 1982; NOAA Fisheries, 2011e). While no strandings of green sea turtles have been reported in Queens County, New York, they have been reported in neighboring counties between 2008 and 2013 (SEFSC, 2013). Because green sea turtles previously have been observed in the New York Bight during summer months, we conclude that the species potentially could occur in the offshore construction area between June and early November.

Loggerhead

The loggerhead sea turtle initially was listed as federally threatened throughout its range (FWS, 2012a), but in 2011, the species was divided into nine DPS, including the North Atlantic Ocean DPS, which is listed as federally endangered (NOAA Fisheries, 2011b; FWS, 2012a). The main threat to loggerhead sea turtles is incidental capture in fishing gear. Other threats include noise from boating traffic, seismic testing and other sound sources, direct harvest, ingestion of marine debris, and loss of nesting habitat (NOAA Fisheries, 2011b; NOAA Fisheries, 2011b, 2011c). In New York marine waters, the loggerhead is the most frequently observed sea turtle between June and mid-November. During these summer and fall months, waters of the continental shelf in the New York Bight have been reported to harbor significant concentrations of loggerheads (CeTAP, 1982). The occurrence of this species in Queens County, New York has been confirmed by reported strandings and sightings within the New York Bight (SEFSC, 2013). Because they have been documented in the region, we conclude that loggerheads potentially could occur within the offshore construction area between June and November.

Potential Project Effects

Underwater Noise

Sea turtles could have similar reactions to underwater noise as marine mammals, but reactions have not been well documented. Additionally, the hearing capabilities of sea turtles are much less studied and not as well-known as those of marine mammals. Various studies have shown that sea turtle hearing is varied based on species and age of the animal. Like large whales, sea turtles appear to hear best at lower frequencies. Juvenile loggerheads were found to have an effective hearing range of 250 to 750 Hz with peak sensitivity at 250 Hz (Bartol et al., 1999). Lenhardt (1994) reported loggerhead sea turtles exhibited a startle response from low frequency (20 to 80 Hz) sources and determined that an effective hearing range for sea turtles was 100 to 800 Hz, with an upper limit of 2,000 Hz. Ketten and Bartol (2005)

reported similar findings, but differences were noted when comparing juveniles and adults. They found that hatchling loggerhead sea turtles, their smallest experimental group, had the greatest hearing range at 100 to 900 Hz, whereas adult green sea turtles, their largest experimental group, had the most condensed hearing range at 100 to 500 Hz. Overall, these studies show that sea turtles hear best at low frequencies, with the potential for some sensitivity to high frequency sounds up to 2,000 Hz.

Based on the threshold levels reported in Table 4.5.2-1, we conclude that none of the listed sea turtle species would be injured by noise associated with pile driving activities. The noise from the vibratory hammer would exceed the behavioral disturbance threshold for sea turtles, but for a short distance (i.e., 13.1 feet) from the pile driving activity. We have added a recommendation in Section 4.5.2.1 that Transco file a noise monitoring and mitigation plan to ensure that actual noise is consistent with predicted values and/or to reduce the noise to acceptable levels.

Given the short distance predicted for noise impacts as well as Transco's plan to implement soft-start procedures for the vibratory hammer, any sea turtles present at the time of construction would be likely to move away from the area before the noise level from the pile driving exceeds the behavioral disturbance threshold. As noted elsewhere, the installation and removal of the piles would occur over a relatively short period. Transco estimates that it would take about 60 seconds of continuous driving to install each individual pile, and that all the piles would be installed over a period of approximately 10 days. The total operating time of the vibratory hammer for extraction of the piles at the end of the construction period is estimated to be similar to the installation time.

Sea turtles could be disturbed by the noise generated by the largest construction vessels (up to 180 dB re 1 µPa RMS), but most of the offshore work would likely be completed during the spring when sea turtles are less likely to be present. Furthermore, the route of the Rockaway Delivery Lateral is close to the Port of New York and New Jersey, which is used by commercial vessels that are larger and noisier than those that would be used for construction of the pipeline. Sea turtles that routinely spend time in the region are probably accustomed to the continuous noise of these large vessels. Therefore, we conclude that individual sea turtles could potentially be exposed to vessel noise caused by construction of the pipeline, but this exposure is unlikely to result in any significant impacts.

In conclusion, the potential effects on sea turtles due to pile driving and vessel noise during construction are expected to be limited based on the low level of sound produced by the activities and the limited area where noise would exceed injury or behavioral disturbance thresholds. If sea turtles are present in the area during construction, the effects of the Rockaway Project would be limited to short-term changes in behavior or temporary avoidance of the area. Therefore, noise generated by the Rockaway Project is not expected to significantly affect sea turtles.

As discussed above, Transco would conduct a post-installation hydrographic survey to document seafloor elevations along the pipe trench and other offshore excavation areas using a multi-beam echo sounder and side-scan sonar. Operating frequencies for this equipment are outside the hearing range for sea turtles. Therefore, the sound associated with the post-installation hydrographic survey would not affect sea turtles.

Vessel Traffic

Construction activities are not expected to generate a large amount of increased vessel traffic within the construction area. The largest vessels (i.e., the clamshell barge, jack-up barge, and pipe lay barge) would remain at the offshore work site during construction and would be stationary or traveling at slow speeds. Vessels that would be transiting would comply with vessel speed and approach restrictions required by NOAA Fisheries, and a NOAA Fisheries-approved observer would be in the construction area to observe for sea turtles and other species. Additionally, Transco committed to maintaining a separation

distance of 45 meters (148 feet) between the vessels and any turtles that are sighted (see Attachment 1 to Appendix I). Therefore, we do not expect sea turtles to be effected by vessel traffic.

Bottom Disturbance

Bottom-disturbing activities are unlikely to affect the foraging or feeding of green and leatherback sea turtles. Green sea turtles primarily feed on sea grasses, which would not be affected by construction of the offshore pipeline. Leatherbacks feed primarily on gelatinous pelagic invertebrates, which are found within the water column and not on the seafloor.

The various bottom-disturbing activities proposed by Transco may temporarily disrupt prey assemblages for loggerhead and Kemp's ridley sea turtles in the area of direct impact. Disturbance of bottom sediments during dredging, trenching, hand jetting, pile driving, or anchoring could remove slow-moving crustaceans such as horseshoe crabs and non-motile prey such as mollusks, both of which have been reported in the benthic environment of the construction area. These prey species are likely widespread and prevalent throughout the New York Bight region due to similarity of the surrounding benthic habitats. Moreover, none of the construction area has been identified as an important feeding area for either the loggerhead or Kemp's ridley sea turtles. Therefore, should either species be present in the construction area during bottom-disturbing activities, their ability to forage on preferred prey species in the surrounding sandy bottom habitat most likely would not be affected.

As discussed in Section 4.6.3.2, benthic assemblages are expected to recover within two years or less following construction activities, (AKRF, Inc., et al., 2012; Bain et al., 2006; Brooks et al., 2006; Diaz et al., 2004; Germano et al., 1994; Hirsch et al., 1978; Kenny and Rees, 1994, 1996; LaSalle et al. (1991); Murray and Saffert, 1999; Newell et al., 1998; NOAA Fisheries Northeast Region, 2013a; Rhoades et al., 1978; Rhoads and Germano, 1982). Additionally, we have added a recommendation in Section 4.6.3.2 that Transco file a post-construction benthic sampling and monitoring plan to ensure that benthic communities recover as expected. For these reasons, the Rockaway Project would not have a permanent impact on forage species in the area.

There currently is no information available about the direct impact of suspended sediments on sea turtle species. Turbidity may change turtle behavior and cause loggerhead or Kemp's ridley sea turtles present within the area during construction to move away from the disturbance. As stated above, turbidity plumes due to offshore construction activities would be localized and temporary, and would therefore have minimal and short-term impact on the substrate and water column in the area.

As loggerhead and Kemp's ridley sea turtles are primarily bottom feeders, both species could potentially interact with the jet sled, clamshell dredge, hand-jetting equipment, and suction dredge due to the equipment's contact with the seafloor. Because of the slow trenching and dredging rates (see the discussion of interactions with equipment in the Atlantic sturgeon assessment above), a small portion of the seafloor is affected at one time, so sea turtles are at minimal risk for take (USACE, 2009; Dickerson et al., 2004). There is potential for loggerhead or Kemp's ridley sea turtles to be caught in the suction dredge during backfilling, but this risk would be low due to the low density of turtles expected to be in the area, the small area subject to suction dredging at any given time, and the relatively short duration of the backfilling operation (up to 15 days). The potential for a turtle to be caught in the suction dredge would also be mitigated by Transco's installation of a turtle screen on the suction pan in the dredge. Green or leatherback sea turtles would not be expected to come in contact with the jet sled or dredges as they are not benthic feeders and would be found more generally within the water column.

In conclusion, bottom-disturbing activities such as dredging and jetting potentially could affect loggerhead and Kemp's ridley sea turtles, particularly due to the impacts of construction on the prey for

these species. The offshore construction area for the Rockaway Delivery Lateral is not known as important foraging habitat for these species and it is not unique from the surrounding New York Bight region. Therefore, any loggerhead or Kemp's ridley sea turtles that are deterred from feeding within the construction area would probably move to nearby habitat to feed, so disturbance of foraging habitat would be minimal and temporary. Turbidity in the construction area could displace leatherback and green sea turtles but the effect would be temporary and would not permanently deter sea turtles from returning to the area once the turbidity has dissipated. Sea turtles are unlikely to be entrained by the jet sled or dredges due to the slow rates of movement for this equipment, the use of a turtle screen on the suction dredge, and the small area of disturbance during construction. Therefore, bottom-disturbing activities during construction of the Rockaway Delivery Lateral are not expected to affect sea turtle behavior.

Hydrostatic Testing

Turtles could be affected by hydrostatic testing, but this is unlikely. The uptake and use of seawater for the hydrostatic tests is not expected to affect sea turtles because the amount of plankton being removed from the marine environment would be relatively small, and Transco would use screens on the water intakes to reduce the amount of invertebrates that could be entrained within the pipeline. Impingement on the intake screen is possible but unlikely.

Impingement of turtles associated with intakes of nuclear power plants has been reported, but these generally involve much higher withdrawal rates. The Salem nuclear power generating station on the Delaware River in New Jersey, for example, has 12 pumps with a combined withdrawal capacity of 2.1 million gallons per minute (PSEG Nuclear, LLC, 2009). In contrast, the water for the proposed hydrostatic testing for the Rockaway Delivery Lateral would be withdrawn at a rate of about 4,000 gallons per minute. Healthy sea turtles are strong swimmers and would likely be able to avoid the relatively low approach velocity of the intake. Additionally, the number of turtles that may be present relative to the area available for their use in the New York Bight is small, and it is unlikely that any turtles would be in the vicinity of the intake during the approximately 2 hours that it would take to fill the pipeline. Additionally, the suction head or submersible pump would be elevated off the seafloor to minimize risks to turtles. Transco estimates that the intake would be positioned 20 feet below the surface, which would place the intake 10 to 30 feet off of the seabed depending on the exact location of the withdrawal operation.

There would be potential for temporary impingement of sea turtles during the intake of water for the hydrostatic tests, but the suction head or submersible pump would be elevated off the seafloor to minimize this risk. The discharge of the seawater used during hydrostatic testing is not be expected to affect sea turtles as the water would be diffused before it is released back to the marine environment. This would re-oxygenate and mix the test water with surrounding seawater thereby diluting the concentrations of the biocide and oxygen scavenger (at a rate of 15:1) in the test water. The resulting concentrations of these additives are not expected to cause adverse effects on marine organisms, including sea turtles.

Trash, Debris, Spills, and Hydrostatic Testing

While sea turtles could be exposed to operational waste or solid debris during construction, construction vessels would adhere to the USCG marine trash policy and the SPCC Plan (see Appendix F), so entanglement in or ingestion of marine debris or pollutants would not be expected during normal operations. As indicated above, Transco's SPCC Plan does not identify emergency response procedures for offshore spills, but we have added a recommendation in Section 4.3.2.3 that Transco file an updated plan that includes specific measures to be implemented to identify, control and clean up any accidental leaks or spills from offshore construction vessels.

Marine Turtle Conclusion

Transco would implement the following measures to minimize the potential for impacts on sea turtles during construction:

- employing an onboard NOAA Fisheries-approved observer to monitor for the presence of sea turtles (and other marine species) during construction; and
- documenting and reporting the behavior and movement of the sea turtles to NOAA Fisheries.

Based on these measures, and the analysis presented above, we have determined that the Rockaway Project *may affect, but is not likely to adversely affect*, the leatherback, Kemp's ridley, green, or loggerhead sea turtles.

4.7.1.4 Cumulative Impacts for Marine Species

For analyses of federally listed threatened and endangered species, "cumulative effects" are defined by the FWS and NOAA Fisheries as those of future state or private activities, not involving Federal activities, that are reasonably certain to occur in the area of a federal action subject to consultation under the ESA (50 CFR §402.2). This definition is specific to Section 7 analyses and should not be confused with the broader use of the term "cumulative impacts" in NEPA or other environmental laws.

There are no known non-federal, in-water projects scheduled in the vicinity of the Rockaway Delivery Lateral, but there is ongoing activity on the water in and around this area. The immediate area of offshore construction is expected to be used by recreational and state-regulated commercial fishing activities, including gill net, dredging, pound net, trawl, and hook and line fishing. These activities could result in the by-catch of sea turtles or Atlantic sturgeon evaluated in this final EIS. In addition, fishing vessels and other recreational boat traffic could impact sea turtles and whales through vessel collisions and increased vessel noise.

The transit portion of the construction area for the proposed pipeline is used continuously by commercial vessels entering and exiting the Port of New York and New Jersey. Shipping traffic along this route potentially could impact sea turtles and right whales through vessel collisions and increased vessel noise. The species evaluated in this BA may also be affected by ingestion of debris, such as plastics and petroleum products, generated by ship traffic unrelated to the Rockaway Project in the area. The offshore construction area is located outside the major shipping channel into the Port of New York and New Jersey and, therefore, no commercial vessel traffic or additional commercial vessel-related impacts are expected near the offshore construction area.

Offshore construction would include activities that would create turbidity, sedimentation, and bottom disturbance in the offshore construction zone. Bottom trawling associated with surfclam harvesting in New York State waters could increase the turbidity and sedimentation as well as the disturbance of the sediment and benthic assemblages in the vicinity of the proposed pipeline. The commercial surfclam fishery operates throughout the year, so there would be potential for surfclam harvesting to occur during the proposed construction schedule. Trawling would not occur within the 5,000-foot-wide temporary offshore workspace while construction activities for the pipeline are underway. Any sediment disturbed by construction would settle quickly and fairly close to the disturbed area regardless of its source, which would limit the potential cumulative effect on any one area.

Any disturbance or take of Atlantic sturgeon or sea turtles due to construction of the Rockaway Delivery Lateral could compound the take that occurs in the region due to commercial fishing by-catch.

Within the Atlantic pelagic long-line fleet, an estimated 727 loggerhead sea turtles were caught annually between 1992 and 2006 (Moore et al., 2009). Of these, approximately 38 died per year (Moore et al., 2009). For U.S. mid-Atlantic sink gillnet gear, an average of approximately 350 loggerheads were caught annually between 1995 and 2006 (Murray, 2009). Observed by-catch of other sea turtles in sink gillnets during this same period was a fraction of the loggerhead by-catch (12 percent for green and leatherback and 20 percent for Kemp's ridley species). Hundreds more loggerhead turtles are estimated to have been caught annually in mid-Atlantic scallop dredge equipment (310 per year from 2003 to 2005) and mid-Atlantic bottom trawl gear (616 per year from 1996 to 2004) (Murray, 2009).

By-catch of the Hudson River DPS of Atlantic sturgeon is suspected to be a factor in retarding or curtailing recovery (Atlantic States Marine Fisheries Commission [ASMFC], 2007). Average annual Atlantic sturgeon by-catch in sink gillnets between 2001 and 2006 was 5,143, with a mortality rate of approximately 13.8 percent. During the same period, average annual Atlantic sturgeon by-catch in otter (bottom) trawl gear was 3,829, but the mortality was almost negligible. The highest incidence of sturgeon by-catch was observed during April and May in water depths less than 131 feet (ASMFC, 2007). The Rockaway Delivery Lateral is unlikely to contribute significantly to these cumulative totals because it would take place in a single year over a relatively short timeframe. Additionally, Transco has proposed a number of measures to minimize the potential effects of construction on whales, turtles, and Atlantic sturgeon.

The Rockaway Delivery Lateral would result in a minor, temporary increase in local vessel traffic. This could increase the cumulative likelihood of vessel collisions with right whales or sea turtles, but the effect would not be significant. The vessels associated with construction of the pipeline, as with other vessels within the area, would abide by NOAA Fisheries speed guidelines to reduce collisions.

The increased vessel traffic due to pipeline construction could add marine debris and contaminants to the local marine environment. All vessels operating as part of the Rockaway Project would follow the SPCC Plan (see Appendix F) and USCG guidelines for marine trash. While Transco's SPCC Plan does not identify emergency response procedures for offshore spills, we have added a recommendation in Section 4.3.2.3 that Transco file an updated plan prior to construction that identifies specific measures to be implemented to identify, control and clean up any accidental leaks or spills from offshore construction vessels. Therefore, the Rockaway Project would have no effect on the cumulative impact of marine debris and contaminants.

Lastly, offshore construction and increased vessel activity in the vicinity of the Rockaway Delivery Lateral would create a temporary increase in human-generated noise in the local marine environment, which could add to the cumulative noise effect of other vessels in the area. The duration of the offshore construction activities for the pipeline would last a few months, and would contribute temporarily to the cumulative marine noise impact.

4.7.1.5 Birds

Roseate Tern

The roseate tern is a federally listed seabird that nests in colonies on small barrier islands and coastal habitats in the northeast, including in Queens County, New York (FWS County List, FWS, 2013b). The species is migratory, arriving to breed in the northeast in April and then migrating to the waters off the coast of South America in August (FWS, 2013b). Transco would utilize the HDD pipeline installation method to avoid disturbance to the beach and near shore habitats where the birds most likely would be present in the area. Activities between the HDD entry point and the shoreline would be limited to pedestrian monitoring of the drill path for inadvertent releases of drilling fluid. We believe these

measures would avoid or minimize potential impacts on roseate terns. Consequently, the Rockaway Project *may affect, but is not likely to adversely affect* the roseate tern.

Piping Plover

The piping plover is a federally listed threatened species in Queens County, New York (County Listing Reference) that nests on dry sandy beaches of the Atlantic Coast, including those found on the Rockaway Peninsula. The species is migratory, arriving to breed in New York in early to mid-March and migrating to winter on the Gulf Coast by September (FWS, 2013a; NYSDEC, 2013).

Transco would utilize the HDD construction method to install the pipeline beneath the beach and shoreline, which would avoid disturbing piping plover habitat. Activities between the HDD entry point and the shoreline would be limited to pedestrian monitoring of the drill path for inadvertent releases of drilling fluid. While construction noise associated with the HDD potentially could disturb piping plovers, as discussed in Section 4.11.2, the noise would be less than 55 dBA in the vicinity of the beach and would not likely affect the species.

We received a comment from the NPS that staff from the Natural Resource Management Division at the GNRA should accompany Transco during pedestrian monitoring of the drill path between the months of March and September to ensure that impacts on piping plovers or any other sensitive species (including plants such as seabeach amaranth and seabeach knotweed) are avoided. Therefore, **we recommend that:**

- **Prior to construction of the Rockaway Delivery Lateral, Transco should consult with the NPS to identify a protocol for coordinated monitoring of the drill path in the GNRA between the months of March and September for the presence of sensitive species, and file documentation of the consultation with the Secretary.**

We believe that implementation of this recommendation and the other measures identified by Transco would avoid or minimize potential impacts on piping plovers. Consequently, the Rockaway Project *may affect, but is not likely to adversely affect* piping plovers.

4.7.1.6 Plants

Seabeach amaranth is a federally listed plant species known to occur in the vicinity of the Rockaway Project. This plant species occupies sandy beach habitats along the Rockaway Peninsula in Queens County, New York (County Listing Reference, FWS, 2013c). Transco would utilize the HDD construction method to install the pipeline beneath the beach and shoreline on the Rockaway Peninsula, which would avoid disturbing seabeach amaranth habitat. Activities between the HDD entry point and the shoreline would be limited to pedestrian monitoring of the drill path for inadvertent releases of drilling fluid. As noted above, we have added a recommendation in Section 4.7.1.6 that Transco consult with the NPS to identify a monitoring protocol for the drill path between the months of March and September when sensitive species, including seabeach amaranth, may be present in the area. We believe these measures would avoid or minimize potential impacts on seabeach amaranth. Consequently, the Rockaway Project *may affect, but is not likely to adversely affect* this species.

4.7.1.7 Insects and Invertebrates

No federally listed insects or invertebrates were identified by the FWS for Kings or Queens County (County Listing Reference). Therefore, we conclude that the Rockaway Project would have *no effect* on federally listed insect or invertebrate species.

4.7.2 Federally Listed Species – Northeast Connector Project

Construction activities at Compressor Station 195 with the potential to affect federally listed species primarily would be limited to the temporary removal of herbaceous vegetation in the station yard and the permanent removal of 25 to 27 trees within a hedgerow at the site. The proposed modifications at Compressor Stations 205 and 207 generally do not have potential to affect federally listed species. Transco would replace/modify equipment within the existing compressor building at each of these sites. This would be achieved primarily with a software change to the motor controls to allow the existing electric motors to run at a higher hp.

Transco maintains an agreement with the FWS-Pennsylvania Field Office (PFO) that exempts certain modifications of existing Transco facilities (such as compressor stations) from further review for impacts on federally listed threatened and endangered species. The FWS-PFO determined that activities covered by the agreement would have no effect on or would not likely adversely affect federally listed species. The agreement requires Transco to screen projects involving earth disturbance or vegetation clearing using an online tool (the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Tool) to determine if consultation with the FWS-PFO is necessary to assess impacts on federally listed species. Transco's review of the Northeast Connector Project using the PNDI Environmental Review Tool determined that additional review by the FWS was necessary for activities at Compressor Station 195. Transco subsequently sent a request for comment to the FWS-PFO. In its reply to Transco, the FWS-PFO indicated that the proposed modifications at Compressor Station 195 are not likely to adversely affect the bog turtle.

Transco similarly maintains an agreement with the FWS-New Jersey Field Office (NJFO) that exempts certain modifications of existing Transco facilities from further review for impacts on federally listed species. The FWS-NJFO determined that activities covered by the agreement are not likely to adversely affect federally listed species. Because the proposed modifications at Compressor Stations 205 and 207 would occur within existing compressor buildings, they are covered by the agreement. Therefore, no further review of the Northeast Connector Project by the FWS-NJFO is warranted.

Indiana Bat

The Indiana bat is a federally listed endangered species that is found in York County, Pennsylvania, and Mercer and Middlesex Counties, New Jersey (County Listing Reference). The Indiana bat is relatively small, weighing 0.25 ounce, with a wingspan of 9 to 11 inches. It hibernates during winter in caves or, occasionally, in abandoned mines from October through April. For hibernation, it requires cool, humid caves with stable temperatures, under 50 °F but above freezing. The hibernacula typically have large volumes of bats and often have large rooms and vertical or extensive passages.

When active, the Indiana bat roosts in dead trees, dying trees, or live trees with exfoliating bark. During the summer months, most reproductive females occupy roost sites that receive direct sunlight for more than half the day. Roost trees are generally found within canopy gaps in a forest, fence line, or along a wooded edge. Maternity roosts are found in riparian zones, bottomland and floodplain habitats, and wooded wetlands, as well as upland communities. Indiana bats forage in semi-open to closed

forested habitats, forest edges, and riparian areas. Threats to the species include loss or degradation of habitat and exposure to pesticides and other contaminants (FWS, 2013d).

Construction activities at Compressor Station 195 would require the removal of 25 to 27 trees from within a hedgerow. The trees consist of live, relatively small conifers that are unlikely to provide suitable habitat for Indiana bat. Additionally, the trees are located on an existing and previously disturbed industrial site that is unlikely to be used by Indiana bat. We also note that the FWS-PFO did not identify impacts on Indiana bat as a concern in its response to Transco's request for comment. No trees would be removed at Compressor Stations 205 and 207. Construction activities at these sites would be consistent with the categorical exemption agreement between Transco and the FWS-NJFO regarding impacts on federally listed species at existing Transco facilities. For all these reasons, we conclude that the Northeast Connector Project *may affect, but is not likely to adversely affect* Indiana bats.

Bog Turtle

The bog turtle is a federally listed threatened species that is found in York County, Pennsylvania and Mercer and Middlesex Counties, New Jersey (County Listing Reference). Bog turtles measure about 3 to 4 inches in length and are characterized by a dark brown to black shell and yellow or orange blotches on either side of the head. They are found in open canopy wetlands and sedge meadows, nesting in sphagnum moss or sedges near water. Bog turtles are active from April through October, lying dormant in abandoned burrows, tree roots, logs, or mud over the winter months. Threats to bog turtles include habitat loss, degradation, or fragmentation and illegal trade in turtles (FWS, 2013e, 2013f, and 2013g).

Bog turtles are unlikely to be present at Compressor Station 195 because there are no wetlands at this site. Additionally, we note that the FWS-PFO concluded that activities at Compressor Station 195 are not likely to adversely affect this species. Bog turtles could be present at or in the vicinity of Compressor Stations 205 and 207, both of which contain wetlands within the boundaries of the sites. Construction activities would be confined to the existing compressor buildings at each site, so the wetlands would not be disturbed. We also note that construction would be consistent with the agreement between Transco and the FWS-NJFO regarding impacts on federally listed species at existing Transco facilities. Therefore, we conclude that the Northeast Connector Project would have *no effect* on bog turtles.

Swamp Pink

Swamp pink, a lily, is a federally listed threatened species that occurs in Mercer and Middlesex Counties, New Jersey (County List References). The species is typically is found in wetlands with canopy cover. Swamp pink has dark green, oblong leaves that form a rosette, some of which produce a flowering stock. Flowers occur in clusters of 30 to 50 at the end of the stock. The flowers are pink with blue anthers. The plant is visible year round with flowering occurring from March to May. Threats to swamp pink include development, degradation of habitat, pollution, and invasive species (FWS, 2013h).

Swamp pink could be present at or in the vicinity of Compressor Stations 205 and 207, both of which contain wetlands with the boundaries of each site. Construction activities would be confined to the existing compressor buildings at each site, so the wetlands would not be disturbed. We also note that the proposed activities at Compressor Stations 205 and 207 would be consistent with the agreement between Transco and the FWS-NJFO regarding impacts on federally listed species at existing Transco facilities. Therefore, we conclude that the Northeast Connector Project would have *no effect* on swamp pink.

4.7.3 Project Operations

To assist in our assessment of impacts on federally listed species for operation of the Projects, Transco provided summaries of projected operational impacts for wildlife (see Sections 4.5 and 4.6) and federally listed species. We reviewed this information, conducted our own analyses, and consulted with the FWS, NOAA Fisheries, and the NPS regarding these impacts. Our conclusions regarding operational impacts are described below.

4.7.3.1 Rockaway Delivery Lateral

Transco proposes to retain a 50-foot-wide permanent operational right-of-way, both onshore and offshore within the GNRA, and a 200-foot-wide permanent right-of-way seaward of the GNRA boundary. As the HDD section of the pipeline beneath Jacob Riis Park generally would be inaccessible deep below the surface, Transco would not actively maintain the onshore right-of-way and the land would continue to be managed for existing uses by the NPS. Additionally, Transco would not actively maintain the sea bottom within the offshore right-of-way. Therefore, no adverse effects to federally listed marine or terrestrial species are expected as a result of right-of-way maintenance.

During operation, Transco periodically would need to access the subsea manifold to install a temporary launcher and conduct an internal inspection of the pipeline. Transco anticipates this would occur approximately once every 7 years. To conduct each inspection, Transco would remove sediment over the manifold using a submersible pump or divers using hand-jetting or air-lifting equipment. The impacts associated with maintenance activities would be similar to construction impacts, but on a significantly smaller scale. As such, maintenance activities would result in minor, temporary impacts on the marine environment at the location of the subsea manifold. Therefore, we conclude that these activities would not adversely affect federally listed species.

4.7.3.2 M&R Facility

Transco's M&R facility would be located in Hangars 1 and 2 at Floyd Bennett Field in Kings County. The FWS has not identified any federally listed species as occurring in this county. Therefore, we conclude that operation of the M&R facility would not affect federally listed species.

4.7.3.3 Compressor Stations

At Compressor Station 195, Transco would restore areas affected by construction (with the exception of areas covered by new buildings) in accordance with the FERC Plan. Ongoing maintenance activities would require periodic mowing of grass areas in the station yard, but this activity already occurs at the site. No areas outside of existing compressor buildings would be disturbed at Compressor Stations 205 and 207. Noise resulting from operation of the compressor stations has the potential to affect federally listed species, but the impact would be beneficial at Compressor 195 and minor at Compressor Stations 205 and 207. As discussed in Section 4.11.2, Transco's plan to replace three existing gas-fired compressors with electric driven motors at Compressor Station 195 would result in a slight reduction in ambient noise conditions at the site. The increase in noise at Compressor Stations 205 and 207 would be less than 2 dB at NSAs in the vicinity of each site. Therefore, we conclude that operation of the compressor stations as a result of the Northeast Connector Project would not adversely affect federally listed species.

4.7.4 Staff Recommendations for Threatened and Endangered Species

Based on Transco's proposed mitigation measures and the analyses presented above, we have determined that the Rockaway Project *may affect, and is likely to adversely affect*, the right whale and Atlantic sturgeon; *may affect, but is not likely to adversely affect*, shortnose sturgeon, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle, loggerhead sea turtle, roseate tern, piping plover, and seabeach amaranth; and would have *no effect* on the fin whale and humpback whale. We have not completed our consultations with NOAA Fisheries and the FWS regarding these species. Therefore, **we recommend that:**

- **Transco should not begin construction activities for the Rockaway Delivery Lateral <u>until</u>:**

  a. the FERC staff receives written comments from NOAA Fisheries, Protected Resources Division and the FWS regarding impacts on the federally listed species;

  b. the FERC staff completes formal consultation with NOAA Fisheries/FWS, if required; and

  c. the Director of OEP approves Transco's plans and notifies Transco in writing that the mitigation measures may be implemented and construction may proceed.

Based on information provided by Transco, including its categorical exemption agreements with the FWS-PFO and FWS-NJFO, as well as our own analyses, we have determined that the Northeast Connector Project *may affect, but is not likely to adversely affect* Indiana bat and would have *no effect* on bog turtle and swamp pink. No further consultation for these determinations is required.

4.7.5 State-Listed Species

In addition to federal law, New York, New Jersey, and Pennsylvania have passed laws to protect state-listed threatened and endangered species. These include the revised New York ESA (New York Environmental Conservation Law § 11-0535 and 6 NYCRR Part 182), the New Jersey Endangered and Nongame Species Conservation Act (New Jersey Statutes 23:2A-1-15), and Chapter 34 (Game and Wildlife Protection) in Title 34 of the Pennsylvania Consolidated Statutes. The goals of each of the state endangered species laws are to conserve, protect, restore, and enhance any listed species and their habitats.

4.7.5.1 New York

In correspondence with Transco, the NYSDEC identified 17 New York state-listed species that potentially could occur in the Rockaway Project area (see Table 4.7.5-1). Two additional state-listed whale species were identified and addressed by Transco as discussed in the IHA (see Appendix N). Of these 19 species, ten are federally listed and discussed above in Section 4.7.1. The remaining nine species include a state-listed fish, diurnal raptors, owls, and plants. Two insect species that are not protected in New York were included on the NYSDEC's list because they are rare in the vicinity of the Rockaway Project.

TABLE 4.7.5-1
State of New York Sensitive Species Potentially Occurring in the Rockaway Project Area

Species	New York Status	Likelihood of Occurrence in Project Area
Marine Mammals		
Fin whale *(Balaenoptera physalus physalus)* [a]	Endangered	Not expected
Humpback whale (*Megapera novaeangliae*) [a]	Endangered	Not expected
North Atlantic right whale (*Eubalaena glacialis)* [a]	Endangered	Low
Marine Reptiles-Sea Turtles		
Loggerhead sea turtle (*Caretta caretta)* [a]	Threatened	Moderate
Kemp's ridley sea turtle (*Lepidochelys kempii)* [a]	Endangered	Moderate
Green sea turtle (*Chelonia mydas)* [a]	Threatened	High
Leatherback sea turtle (*Dermochelys coriacea)* [a]	Endangered	Moderate
Marine Fish		
Shortnose sturgeon (*Acipenser brevirostrum)* [a]	Endangered	Not expected
Birds		
Roseate tern (*Sterna dougalli)* [a]	Endangered	Moderate
Piping plover (*Charadrius melodus)* [a]	Threatened	High
Northern harrier (*Circus cyaneus*)	Threatened	Low
Peregrine falcon *(Falco peregrinus)*	Endangered	High
Barn owl (*Tyto alba)*	Protected wildlife	Low
Short-eared owl (*Asio flammeus*)	Endangered	Low
Insects		
Red-banded hairstreak (*Calycopis cecrops*)	None/rare occurrence in area	Moderate
White-banded hairstreak (*Parrhasius m-album*)	None/rare occurrence in area	Moderate
Plants		
Red pigweed (goosefoot) (*Chenopodium rubrum)*	Threatened	Moderate
Schweinitz's flatsedge (*Cyperus schweinitzii)*	Rare	Low
Seabeach amaranth (*Amaranthus pumilus)* [a]	Threatened	High
Seabeach knotweed (*Polygonum glaucum*) [b]	Rare	Low
Dune sandspur (*Cenchus tribultoides*) [b]	Threatened	High

Sources: NYSDEC, NYNHP; Edinger et al., 2008.

[a] Federally listed species.

[b] Species identified by Edinger et al., 2008 and not by the NYNHP.

[c] Marine mammals, which are protected under the MMPA, are discussed in Section 4.5.2.2 and in Transco's Request for an IHA under the MMPA in Appendix N.

Birds

Northern harriers, which are listed as threatened in New York State, use salt marsh and emergent wetland habitats for foraging, nesting, and wintering. The species nest in drier areas of salt marshes dominated by salt hay, marsh elder, or common reed, and/or in freshwater tidal marshes containing common reed, sedges, and other emergent vegetation (New Jersey Department of Environmental Protection [NJDEP], 2010f).

The peregrine falcon is listed as endangered in New York State. The species often nests on ledges or holes on the faces of rocky cliffs. They also nest on manmade structures such as bridges and tall buildings, especially near or in urban areas. Wintering birds frequent buildings, towers, and steeples in urban areas, and open areas with plentiful prey in more natural settings. Staff from the NPS regularly has observed a peregrine falcon perched atop the Marine Parkway Bridge near the Rockaway Project area.

Barn owls, which are listed as protected wildlife in New York State, typically are found in open and partly open lands such as grasslands, marshes, and agricultural areas, often around human habitations. The species are cavity-nesting birds that use natural or manmade cavities. Preferred manmade structures include large platforms within barns and silos, tunnels dug into silage in roofed or topless silos, and barn cupola shelves. They have also used feed bins, church steeples and belfries, platforms within commercial and industrial buildings, attics of abandoned or occupied houses, ledges within chimneys, and platforms beneath bridges. Foraging habitats typically are open areas, such as grassy fields (natural and agricultural), wet meadows, and fresh and salt water marshes. Barn owls typically use dense conifers as roost sites during the winter, but have used nest boxes as well.

The short-eared owl, which is listed as endangered in New York State, occupies open areas such as grasslands (i.e., hayfields, fallow farm lands, and pastures), as well as fresh and salt water marshes. They tend to prefer habitats with some water possibly because it is the habitat preferred by voles, which are their primary prey. Day roosts typically are found on the ground but also occur under low shrubs, in conifers, or on low open perches. In addition, they can be found at old dumps where rodent populations may be high. The species may move farther south during winters with deep snow cover.

Transco would avoid disturbing sensitive wetland and vegetation areas associated with the southern shore of the Rockaway Peninsula by using the HDD pipeline installation method. Transco conducted surveys along the HDD route and found the coastal wetland area to be relatively devoid of vegetation (Ecology and Environment, Inc., 2009; Ecology and Environment, Inc., 2011; Section 4.4). Surface disturbance to terrestrial habitats in the Rockaway Project area would be limited to artificial surfaces with sparse vegetation at the HDD entry site and tie-in to the National Grid pipeline. Based on the general habitat requirements of the state-listed birds, and Transco's proposal to avoid disturbance to sensitive wetland and beach habitat, we conclude that the Rockaway Project would not likely affect the northern harrier, peregrine falcon, barn owl, or short-eared owl.

Insects

The red-banded hairstreak and white-banded hairstreak were identified by the NYSDEC as potentially occurring in the vicinity of the Rockaway Project. These species are not protected under New York State law, but are listed as being rare in the Rockaway Project area (NYNHP, 2013c). The NYNHP notes that red-banded hairstreak could be expanding in range in New York, and the species is likely to be removed from active tracking lists in the future. Both species can occupy a variety of urban vegetated habitats. White-banded hairstreaks have been observed feeding on white sweet clover in the South Field of Floyd Bennett Field. Given these observations and the potential range of the species, we conclude that red-banded hairstreak and white-banded hairstreak potentially could occur within the Rockaway Project

area, but it is unlikely that they would be affected by the Rockaway Project due to the limited disturbance of vegetation associated with the construction of the M&R facility and pipeline.

Plants

Five wetland and beach associated state-listed or rare plants were identified by the NYSDEC as potentially occurring in the Rockaway Project area. These include the state-listed threatened seabeach amaranth, which is also federally listed and discussed in Section 4.7.1.6; red pigweed (goosefoot) and dune sandspur, which are state-listed as threatened; and Schweinitz's flatsedge and seabeach knotweed, which are state-listed as rare.

Schweinitz's flatsedge occupies sites with exposed, sandy soil, including coastal dunes of the Atlantic (NYNHP, 2013a). Red pigweed has been found along the coast of New York in wet interdunal swales, stony beaches, and the shores of coastal ponds (NYNHP, 2013b), as well as in salt marshes (Clemants, 1992) and brackish soil (Gleason and Cronquist, 1991). Dune sandspur was identified by Transco outside the Rockaway Project area during site visits on the maritime dunes along the Rockaway Peninsula. This observation consisted of 100 clumps of plants located in a small dune area on Plumb Beach in proximity to a large highway with pedestrian traffic in the vicinity. Seabeach knotweed is a state-listed rare plant species that typically occurs along seashores, at the margins of saline ponds, salt marshes, dune hollows, wet pannes, and on borders of tidal streams. According to the NPS, seabeach knotweed may be found at the beach on the Rockaway Peninsula in the vicinity of the proposed pipeline route.

Transco conducted plant surveys along the onshore portion of pipeline route and did not observe any of the state-listed plants within the proposed work areas. Additionally, Transco proposes to utilize the HDD method to install the proposed pipeline beneath the shoreline and beach at the Rockaway Peninsula, which would eliminate any ground disturbing activities in these areas. Construction activities between the HDD entry point and the shoreline would be limited to pedestrian monitoring of the drill path for inadvertent releases of drilling fluid. As noted above, we have added a recommendation in Section 4.7.1.6 that Transco consult with the NPS to identify a coordinated monitoring protocol for the drill path between the months of March and September when sensitive species, including seabeach knotweed, may be present in the area. The NPS conducted plant surveys within 100 feet of each hangar at Floyd Bennett Field and confirmed that no listed plant species are present at the proposed M&R facility site. For all these reasons, we conclude that the Rockaway Project would not affect the New York state-listed plant species.

4.7.5.2 New Jersey

In correspondence with Transco, the NJDEP and the NPS identified 10 waterbird species that forage in proximity to the proposed pipe yard for the Rockaway Project at the C&ME facility in Elizabeth, New Jersey (see Table 4.7.5-2). Transco would use the pipe yard to stage and transport equipment and supplies and to apply concrete coating to pipe. The pipe yard lies in a highly developed industrial area near the Arthur Kill waterway. Normal operations at the C&ME site include construction support and vessel loading operations. Additionally, the areas surrounding the pipe yard lack vegetation, and the shoreline consists of a bulkhead that is designed to accommodate barge mooring. The yard provides little, if any, in the way of foraging habitat for waterbirds. Additionally, waterbirds have access to alternate foraging grounds in the area, including the Arthur Kill waterway and other vegetated shorelines, such as those near Goethels Bridge to the south of the pipe yard. As such, Transco's proposed use of the pipe yard should have little or no negative affect on any New Jersey state-listed waterbirds.

TABLE 4.7.5-2
State of New Jersey Sensitive Species Potentially Occurring in the Rockaway Project Area

Birds	New Jersey Status	Occurrence
Black-crowned night-heron (*Nycticorax nycticorax*)	Threatened	Foraging
Cattle egret (*Bubulcus ibis*)	Threatened	Foraging
Glossy ibis (*Plegadis falcinellus*)	Special concern	Foraging
Least tern (*Sternula antillarum*)	Endangered	Foraging
Little blue heron (*Egretta caerulea*)	Special concern	Foraging
Oyster catcher (*Haematopus palliatus*)	Special concern	Breeding
Piping plover (*Charadrius melodus*)	Federally listed threatened	Breeding
Snowy egret (*Egretta thula*)	Special concern	Foraging
Tricolored heron (*Egretta tricolor*)	Special concern	Foraging
Yellow-crowned night-heron (*Nyctanassa violacea*)	Threatened	Foraging

Sources: New Jersey List of Species or Wildlife Habitat.

While state-listed species could be present in the vicinity of Compressor Stations 205 and 207, construction activities would be limited to the existing compressor buildings at these sites. Additionally, as discussed above and in Section 4.11.2, the increase in noise resulting from the uprate of the compressors at these sites would be minor. For these reasons, we conclude that the Northeast Connector Project should not negatively affect any New Jersey state-listed species.

4.7.5.3 Pennsylvania

Review of the Pennsylvania Natural Heritage Program's list of species of special concern identified 5 reptiles/amphibians, 6 birds, 1 fish, 2 mammals, and 39 plants known to occur in York County that have been designated as state threatened, endangered, or rare. Transco's use of the PNDI Environmental Review Tool to screen the project determined that no review by state agencies is necessary to assess impacts on state-listed species. Based on that determination, and Transco's plan to restore disturbed areas (with the exception of areas covered by new buildings) at Compressor Station 195, we conclude that the Northeast Connector Project would have little or no negative affect on any Pennsylvania state-listed species.

4.8 LAND USE, RECREATION, SPECIAL INTEREST AREAS, AND VISUAL RESOURCES

As discussed in Section 2.1, the Rockaway Project would consist of two components, a 26-inch-diameter natural gas pipeline in Queens County, New York, and an M&R facility and associated piping and equipment in Kings County, New York. For the Northeast Connector Project, Transco would replace three existing natural gas-fired reciprocating engines at Compressor Station 195 in York County, Pennsylvania. This section of the EIS describes the land requirements for the Projects, existing land uses in construction areas, and the likely impacts on land uses resulting from construction and operation of the proposed facilities. This section also identifies designated recreation or other special use areas in the vicinity of the Projects, and describes potential visual impacts of the proposed facilities on specially designated areas, recreation and residential areas, and public lands.

4.8.1 Land Use, Land Cover, General Impacts, and Mitigation

This section discusses land use separately from land cover. "Land use" is defined as the type of activity occurring in any given area, while "land cover" consists of the type of ground surface present in the same area.

4.8.1.1 Land Use

Onshore land uses that would be affected by the Rockaway Project within the GNRA are characterized according to the 1979 GMP (NPS, 1979)[22] (see Figure 4.8.1-1). Onshore land uses that would be affected by the Rockaway Project outside of the GNRA are characterized according to *A Land Use and Land Cover Classification System for Use With Remote Sensor Data* (Anderson et al., 1976). The GMP does not include a formal land use classification for the offshore area in the GNRA that would be affected by the Rockaway Project. Therefore, for the purposes of this section, we have classified the offshore areas both in and outside of the GNRA as marine lands.

Based on the above, 10 land use types would be affected by the Rockaway Project. These include the following:

- Beach: Open sand from the water level landward to the vegetation line used for recreational purposes. This includes the beach at Jacob Riis Park between the offshore portion of the Rockaway Project and the pitch-and-putt golf course above the beach under which the proposed pipeline would be installed.

- Development Support: Cleared and/or developed land used to provide support facilities for beach use and other active recreation. This includes a small area between the beach and pitch-and-putt golf course at Jacob Riis Park under which the proposed pipeline would be installed.

- Protection: Disturbed or undisturbed lands protected from public use. This includes a small area between the beach and pitch-and-putt golf course at Jacob Riis Park under which the proposed pipeline would be installed.

[22] NPS staff currently is in the process of updating the GMP for the GNRA to guide land use and management decisions affecting the park over the next two decades. A draft of the updated GMP/EIS was issued by the NPS for public comment on August 2, 2013. The new GMP is expected to be finalized by the spring of 2014. Therefore, the classifications identified in the existing 1979 GMP were used in this analysis.

Figure 4.8.1-1
Rockaway Delivery Lateral and Northeast Connector Projects
Land Use Classifications
in the Vicinity of the Rockaway Project

- Structured Recreation: Disturbed lands adjacent to beach centers and reserved for active recreation. This includes the pitch-and-putt golf course at Jacob Riis Park under which the proposed pipeline would be installed, and an area in Floyd Bennett Field that would be used during M&R facility construction for parking, equipment lay-down, and vehicle access.

- Unstructured Recreation: Disturbed or undisturbed lands reserved for low-impact activities (e.g., hiking or fishing). The access road that would be used for the M&R facility construction at Floyd Bennett Field would pass through an area with this designation.

- Use-by-Reservation: Natural or cultural resources maintained for environmental education and study and available for compatible uses on a group permit basis. The access road that would be used for M&R facility construction at Floyd Bennett Field passes through an area with this designation.

- Gateway Village: An area in Floyd Bennett Field in and around the hangar complex was proposed in the 1979 GMP to be developed with shops, hostels, mobile-camper parks, housing units for park personnel, educational and community facilities, food services, and open public use. The intent of the GMP was to adaptively reuse existing facilities and mix them with new facilities in this area. The proposed M&R facility and associated temporary workspace would be located in this area.

- Transportation, Communication, and Utilities: The HDD entry location and tie-in with the National Grid system would be constructed on land owned by the TBTA, immediately north of the pitch-and-putt golf course at Jacob Riis Park. The land is used primarily for transportation, including the interchange for the Marine Parkway Bridge and a bike path, and accommodates rights-of-way for communication and utility lines.

- Commercial or Services: Commercial areas are used predominantly for the sale of products and services. Developments in this category range from shopping centers to junkyards to resorts. All office buildings, warehouses, driveways, sheds, parking lots, landscaped areas, and waste disposal areas that support commercial or service uses are included in this classification. The proposed pipe storage yard would be located on commercial land at the existing C&ME facility in Elizabeth, New Jersey. While the surrounding area is generally industrial, C&ME mainly provides marine transportation and construction support services and is better classified as a commercial or services land use.

- Marine: Uses of the Atlantic Ocean near the Rockaway Peninsula include commercial and recreational fishing, shipping, diving, recreational boating, dredged material disposal, and underwater utility crossings.

Table 4.8.1-1 below lists the area of effect for each of the land use types within the Rockaway Project area. Construction of the proposed pipeline within the GNRA would affect about 2.7 acres within the beach, development support, protection, structured recreation, and marine land use categories. Pipeline construction outside of the GNRA, including use of the pipe yard in Elizabeth, New Jersey, would affect about 1,551.7 acres within the marine; transportation, communication, and utilities; and commercial and services land use categories. Construction of the M&R facility within the GNRA would affect about 12.6 acres within the development support, structured recreation, unstructured recreation, use-by-reservation, and Gateway Village land use categories.

TABLE 4.8.1-1
Land Use Types and Acres Impacted by Construction and Operation of the Rockaway Project

	Beach [a]		Development Support [a]		Protection [a]		Structured Recreation [a]		Unstructured Recreation [a]		Use-by-Reservation [a]		Gateway Village [a]		Transportation, Communication, and Utilities [b]		Commercial and Services [b]		Marine		Total	
Facility	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**
PIPELINE FACILITIES																						
Offshore [c]																						
Non-NPS-owned	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,545.5	66.1	1,545.5	66.1
NPS-owned	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4	1.4	1.4
Subtotal	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1,546.9**	**67.5**	**1,546.9**	**67.5**
Onshore [d]																						
Non-NPS-owned																						
Pipeline installation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	1.2	0.0
Pipe yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	5.0	0.0
NPS-owned	0.3	0.4	0.1	0.1	0.1	0.1	0.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	2.0
Subtotal	**0.3**	**0.4**	**0.1**	**0.1**	**0.1**	**0.1**	**0.8**	**1.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.2**	**0.0**	**5.0**	**0.0**	**0.0**	**0.0**	**7.5**	**2.0**
Pipeline Facilities Subtotal	**0.3**	**0.4**	**0.1**	**0.1**	**0.1**	**0.1**	**0.8**	**1.4**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.2**	**0.0**	**5.0**	**0.0**	**1,546.9**	**67.5**	**1,554.4**	**69.5**
M&R FACILITIES																						
NPS-owned																						
Inlet and outlet piping	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9
Hangar complex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1
Workspace and access road	0.0	0.0	0.2	0.0	0.0	0.0	2.4	0.0	0.3	0.0	4.5	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.6	0.0
M&R Facilities Subtotal	**0.0**	**0.0**	**0.2**	**0.0**	**0.0**	**0.0**	**2.4**	**0.0**	**0.3**	**0.0**	**4.5**	**0.0**	**5.2**	**2.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**12.6**	**2.0**
Project Total	**0.3**	**0.4**	**0.3**	**0.1**	**0.1**	**0.1**	**3.2**	**1.4**	**0.3**	**0.0**	**4.5**	**0.0**	**5.2**	**2.0**	**1.2**	**0.0**	**5.0**	**0.0**	**1,546.9**	**67.5**	**1,567.0**	**71.5**

[a] GNRA, 1979 General Management category for onshore areas within NPS boundaries.

[b] Anderson, 1976 Class II category for onshore areas outside NPS boundaries.

[c] Transco would use a 5,000-foot-wide by approximately 13,470-foot-long temporary work area in the ocean during construction of the offshore portion of the Rockaway Delivery Lateral. Of this approximately 1,546.9-acre area, Transco estimates that 29.0 acres of direct seabed impact would occur during construction in non-NPS-owned areas. Areas beyond this 29.0-acre area would be indirectly affected by the suspension and re-deposition of sediment disturbed by the offshore construction activities.

[d] The operational impacts include the 50-foot-wide permanent easement over the pipeline on GNRA lands. This area would not be disturbed during operation or maintenance of the pipeline.

Operation of the proposed pipeline within the GNRA would affect about 3.4 acres within the beach, development support, protection, structured recreation, and marine categories. Pipeline operation outside of the GNRA would affect about 66.1 acres, all within the marine land use category. Operation of the M&R facility would affect about 2.0 acres, all within the Gateway Village land use category.

In its draft GMP/EIS issued on August 2, 2013, the NPS identified management zones that describe the desired conditions for park resources and visitor experience in different areas of the park (NPS, 2013). Under the NPS's preferred alternative (Alternative B) and other action alternative (Alternative C), the proposed onshore pipeline within the GNRA would cross a recreation management zone as well as an active beach subzone. The offshore portion of the pipeline would cross a marine management zone. The boundaries of the active beach subzone are the equivalent to the beach land use category in the 1979 GMP. The recreation management zone that would be crossed encompasses the development support, protection, and structured recreation land use categories identified in the 1979 GMP. The M&R facility would be within a historic management zone, which includes the Gateway Village land use category from the 1979 GMP.

The draft GMP/EIS describes the affected management zones as follows:

- Recreation Management Zone: Park areas that accommodate a variety of recreation activities for fun, learning, and physical activity. These areas offer a broad range of outdoor, educational, and interpretive experiences.

- Active Beach Subzone: Offers traditional summer beach activities including swimming and bathing.

- Marine Management Zone: Waters managed to protect and enhance the ocean and bay environments and provide opportunities for water-based visitor use and recreation. Activities are regulated to protect elements of the natural environment, prevent visitor conflicts, and enhance public safety.

- Historic Management Zone: These areas include fundamental and historic sites, structures, and cultural landscapes linked to GNRA's history. Resources in this area are the focus of interpretation and preservation projects and are managed to ensure the long-term protection of their historic integrity.

Construction activities at Compressor Station 195 would affect up to 25.2 acres of developed/maintained land, all within the existing station yard. This includes areas covered by existing buildings, crushed stone, gravel, and mowed grass. The site also contains trees within hedgerows along the station boundary, the existing access road into the site, and the fence surrounding the existing buildings within the station yard. The site would continue to be used for natural gas transmission service following construction of the Northeast Connector Project.

4.8.1.2 Land Cover

Land cover types that would be affected by the proposed Rockaway Delivery Lateral include open water, barren land, grassland/herbaceous, open space developed, and low/medium/high-intensity developed (Figure 4.8.1-2). The land cover type in the vicinity of the proposed M&R facility is low/medium/high-intensity developed. Definitions of these land cover classifications are below.

- Open Water: Open water with less than 25 percent vegetation or soil cover. This includes the offshore portion of the Rockaway Delivery Lateral.

- Barren Land: Areas of accumulations of earthen material, including sand and gravel, with less than 15 percent vegetation cover. This includes the beach at Jacob Riis Park.

- Grassland/Herbaceous: Areas with more than 80 percent cover of grasses or other herbaceous vegetation that are not subject to intensive management. This includes a small area between the beach and pitch-and-putt golf course at Jacob Riis Park.

- Open Space Developed (open space): Areas with a mixture of constructed materials and vegetation with less than 20 percent impervious surface cover. This includes the pitch-and-putt golf course at Jacob Riis Park.

- Low/Medium/High-Intensity Developed (developed): Areas with a mixture of constructed materials and vegetation. The proposed M&R facility and pipe yard are located on this land cover type.

The acreage of land cover types that would be affected by construction and operation of the Rockaway Project are shown in Table 4.8.1-2. Construction and operation of the proposed pipeline within the GNRA would affect areas assigned to the open water, barren land, grassland/herbaceous, open space, and developed land cover categories. Pipeline construction outside of the GNRA would affect areas within the open water, open space, and developed land cover categories, while pipeline operations outside the GNRA would affect the open water category. Construction and operation of the M&R facility would affect the developed land cover category.

As discussed in Section 4.8.1.1, construction activities at Compressor Station 195 would affect up to 25.2 acres of developed/maintained land within the existing station yard. Ground cover within the yard includes existing buildings; areas covered by gravel, crushed stone, or mowed grass; and a hedgerow. These areas would continue to be used for natural gas transmission service following construction of the Northeast Connector Project.

Figure 4.8.1-2
Rockaway Delivery Lateral and Northeast Connector Projects
Land Cover Classifications
in the Vicinity of the Rockaway Project

TABLE 4.8.1-2
Land Cover Types [a] and Acres Impacted by Construction and Operation of the Rockaway Project

	Open Water		Barren Land		Grassland/ Herbaceous		Open Space		Developed		Total	
Facility	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**
PIPELINE FACILITIES												
Offshore [b]												
Non-NPS-owned	1,545.5	66.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,545.5	66.1
NPS-owned	1.4	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	1.4
Subtotal	**1,546.9**	**67.5**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1,546.9**	**67.5**
Onshore [c]												
Non-NPS-owned												
Pipeline	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.5	0.0	1.2	0.0
Pipe yard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0	0.0
NPS-owned	0.0	0.0	0.2	0.3	0.1	0.2	0.6	1.3	0.4	0.2	1.3	2.0
Subtotal	**0.0**	**0.0**	**0.2**	**0.3**	**0.1**	**0.2**	**1.3**	**1.3**	**5.9**	**0.2**	**7.5**	**2.0**
Pipeline Facilities Subtotal	**1,546.9**	**67.5**	**0.2**	**0.3**	**0.1**	**0.2**	**1.3**	**1.3**	**5.9**	**0.2**	**1,554.4**	**69.5**
M&R FACILITIES												
NPS-owned												
Inlet and outlet piping	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.9
Hangar complex	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1	1.1	1.1
Workspace and access roads	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.5	0.0	10.5	0.0
M&R Facility Subtotal	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**12.6**	**2.0**	**12.6**	**2.0**
Project Total	**1,546.9**	**67.5**	**0.2**	**0.3**	**0.1**	**0.2**	**1.3**	**1.3**	**18.5**	**2.2**	**1,567.0**	**71.5**

[a] Based on National Land Cover Database 2006 (Fry, et al., 2011), as modified by field surveys and aerial photo interpretation.

[b] Transco would use a 5,000-foot-wide by approximately 13,470-foot-long temporary work area in the ocean during construction of the offshore portion of the Rockaway Delivery Lateral. Of this approximately 1,546.9-acre area, Transco estimates that 29.0 acres of direct seabed impact would occur during construction in non-NPS-owned areas. Areas beyond this 29.0-acre area would be indirectly affected by the suspension and re-deposition of sediment disturbed by the offshore construction activities.

[c] The operational impacts include the 50-foot-wide permanent easement over the pipeline. This area would not be disturbed during operation or maintenance of the pipeline.

4.8.1.3 General Impacts and Mitigation

Construction of the Rockaway Project would impact a combined total of 1,567.0 acres of land and marine areas, most of which would be utilized for the pipeline facilities. Following construction, lands within the pipeline right-of-way, facility workspace, pipe yard, and temporary access roads would be allowed to revert to their pre-construction land uses and cover types. The primary land use/land cover types impacted during pipeline construction would be marine/open water (99 percent), while the land use/cover types impacted by construction of the M&R facility would be Gateway Village/developed. Other land use/land cover types would make up a small fraction of the area impacted by construction of the Rockaway Project.

Operation of the Rockaway Project facilities would permanently encumber 71.5 of the 1,567.0 acres impacted during construction. Approximately 69.5 acres, or 97 percent, would be associated with the new permanent right-of-way for the pipeline and the easement for the anode bed/sled. The remaining 2.0 acres (3 percent) would be associated with the M&R facility. The primary land use/land cover type to be newly encumbered on a permanent basis would be marine/open water (94 percent). The Gateway Village/developed (3 percent) and structured recreation/open space (2 percent) areas would account for most of the remaining lands to be permanently impacted. Other land use/land cover types would make up the remaining 1 percent of land encumbered by the permanent right-of-way and M&R facility.

Construction activities at Compressor Station 195 would affect 25.2 acres of developed/maintained land within the existing station site. Following installation of the new facilities, disturbed areas that do not include new permanent facilities would be restored to pre-construction land uses and cover types. The entire area within Compressor Station 195 would continue to be used for natural gas transmission service during the operation phase of the Northeast Connector Project.

4.8.2 Land Ownership

Pipeline operators must obtain easements from existing landowners to construct and operate facilities or acquire the land on which the facilities would be located. Easements can be temporary, granting the operator the use of the land during construction (e.g., for temporary workspace, access roads, or pipe yards); or permanent, granting the operator the right to operate and maintain the facilities after construction. Transco would need to acquire long-term easements and/or special use permits to construct and operate the new pipeline and M&R facility for the Rockaway Project. These authorizations would convey temporary and permanent rights-of-way to Transco for construction and operation of the proposed facilities. Activities for the Northeast Connector Project would occur on lands owned by Transco; no new pipeline rights-of-way or other easements would be required for this project.

An easement agreement between a company and a landowner typically specifies compensation for losses resulting from construction, including losses of non-renewable and other resources, damages to property during construction, and restrictions on existing uses that would not be permitted on the permanent right-of-way after construction. Compensation is based on a market study conducted by a licensed real estate appraiser and, in the case of governmental entities, typically follows agency-specific procedures for determining assessed value and associated payments.

If an easement cannot be negotiated with a non-federal landowner and a project is approved by the Commission, an applicant may use the right of eminent domain to acquire the property necessary to construct the project. This right would extend to all project-related workspace covered by the Commission's approval, including the temporary and permanent rights-of-way, aboveground facility sites, pipe and contractor yards, access roads, and additional workspace. The applicant would still be required to compensate the landowner for the right-of-way and damages incurred during construction, and the level of compensation would be determined by a court according to state or federal law.

Lands affected by construction of the Rockaway Project would consist of both public and private land, as shown in Figure 4.8.2-1. Approximately 81.5 percent of the proposed pipeline would be located offshore on submerged lands owned by New York State. The remainder of the pipeline would be constructed beneath federal lands, both onshore and offshore, administered by the NPS (17.9 percent) and on city lands managed by the TBTA (0.6 percent). The M&R facility would be constructed on NPS lands at Floyd Bennett Field. In addition, Transco is proposing to lease a privately owned 5.0-acre commercial site in Elizabeth, New Jersey for a pipe yard. No tribal land would be affected by the Rockaway Project.

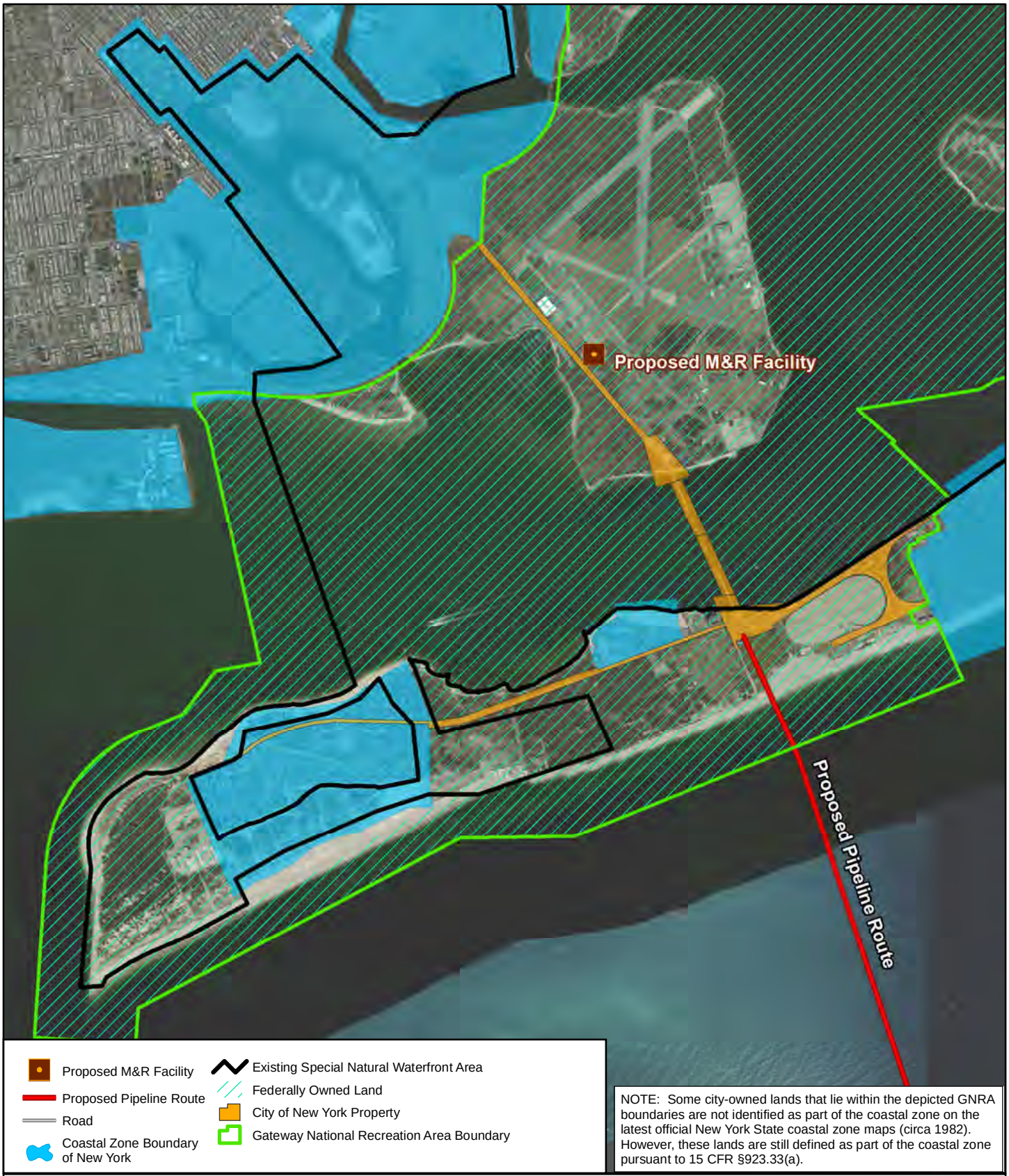

Figure 4.8.2-1
Rockaway Delivery Lateral and Northeast Connector Projects
Land Ownership
in the Vicinity of the Rockaway Project

Federal Lands

The Rockaway Project would cross lands administered by the NPS within the Jamaica Bay Unit of the GNRA. Transco is proposing to install the pipeline across Jacob Riis Park and adjacent offshore submerged lands in the Atlantic Ocean using the HDD method, which would avoid direct impacts on the ground surface or seabed within NPS owned lands. The surface activities associated with construction of the pipeline under NPS lands would be limited to pedestrian traffic between the HDD entry location and the shore to monitor for inadvertent releases of drilling mud.

Transco is proposing to construct and operate the M&R facility and associated inlet and outlet piping within the southernmost historic hangar complex (Hangars 1 and 2) on Floyd Bennett Field. Workspace surrounding the hangar complex would be required during construction, and NPS public roads would be used for access to the facility site.

Construction and operation of the pipeline and M&R facility would be authorized by the NPS under easement and lease agreements. As noted in Section 10.2 (Special Park Uses) of Director's Order No. 53, no general authority exists for the NPS to issue a right-of-way across park lands for oil, gas, natural gas, synthetic liquids, gaseous fuels, or other refined product pipelines. Oil and gas lines that serve NPS facilities may be allowed through a utility contract between the service provider and the NPS under 16 USC § 1-3, so long as these lines serve NPS facilities. Park-specific legislation is required for authority to allow construction of an oil or gas transmission pipeline through NPS lands.

As discussed in Section 1.2.2, Transco coordinated with the NPS and local congressional leaders to introduce a bill (i.e., the New York City Natural Gas Supply Enhancement Act) authorizing the Secretary of the Interior to allow construction and operation of the Rockaway Project subject to receipt of the necessary permits and easements from the NPS. The legislation subsequently was approved by both houses of Congress and signed into law by President Obama on November 27, 2012. The bill supports NPS authority to charge permit fees and rent for the right-of-way associated with the pipeline and lease agreement for the M&R facility, and to apply funds from the fees/rent for infrastructure needs, resource protection, and visitor services in the GNRA. Prior to approval of a right-of-way through the GNRA, the Rockaway Project would be reviewed by the NPS for consistency with NPS management policies and requirements of NEPA. A discussion of impacts and mitigation related to the Rockaway Project within the GNRA is included in Section 4.8.7.

State Lands

Approximately 2.6 miles of submerged lands owned by New York State and administered by the New York State Office of General Services (NYSOGS) would be crossed by the proposed pipeline between its connection with Transco's existing LNYBL and the point about 0.25 mile offshore where NPS jurisdiction begins. Impacts on state-owned lands would include bottom disturbance for the piping and other facilities necessary to tie-in to Transco's LNYBL, installation of 2.15 miles of pipeline using lay barge and jet trenching methods, and the dredging of an exit pit on the seabed for the HDD. Another 0.44 mile of state land would be crossed by the HDD. During construction, Transco would establish a sea surface work zone measuring 2.55 miles (13,470 feet) long by 0.95 mile (5,000 feet) wide for the vessels involved in the installation of the offshore pipeline.

Pursuant to the New York State Public Lands Law, Transco would submit an application to the NYSOGS for an easement to use underwater state-owned lands. This type of easement typically is issued for a term of 25 years, after which a renewal can be granted, and involves the payment of an easement fee based on the per-foot length of the pipeline. A discussion of impacts on offshore uses of state submerged lands is provided in Section 4.8.4.

New York City Lands

Onshore pipeline construction activities, including the HDD entry and tie-in with the National Grid system, would occur within a section of TBTA property located south of Rockway Boulevard and the Marine Parkway Bridge interchange. This area is classified as open space from a land cover perspective (see Table 4.8.1-2) and as transportation, communications, and utilities from a land use perspective (see Table 4.8.1-1). The TBTA operates the Marine Parkway Bridge and its approaches on either side of the Jamaica Bay Inlet. Transco's use of the TBTA lands for construction and operation of the pipeline would be subject to an easement agreement negotiated between TBTA and National Grid.

Installation of the proposed pipeline would be consistent with the transportation, communication and utilities land use classifications of the TBTA property. Approximately 0.7 acre of TBTA land would be temporarily impacted by construction. This area was recently cleared by National Grid for construction of the BQI pipelines, but there is an undisturbed stormwater drain and paved bike path on the south side of the property. Transco would avoid the stormwater drain and other utilities and would install a temporary fence between the bike path and the proposed HDD workspace to separate it from the construction area. The bike path would remain open throughout construction, and Transco would install signs at either end of the construction area to notify the general public about the activities taking place adjacent to the bike path.

Following completion of construction, the HDD entry pit and pipeline trench would be filled, contours would be restored, and the area would be seeded. National Grid would own and operate the pipeline on TBTA property, so Transco would not acquire a permanent right-of-way on TBTA land. Routine inspection and maintenance of the pipeline by National Grid would not disturb TBTA land or its use.

Private Lands

Transco would use existing facilities at C&ME in Elizabeth, New Jersey, for a pipe yard. The site is classified as developed land from a land cover perspective (see Table 4.8.1-2) and as commercial and services land from a land use perspective (Table 4.8.1-1). Transco would contract with C&ME to use about 5.0 acres of their property for pipe and equipment storage and for coating the pipe with concrete. The transfer of pipe and equipment to barges would be consistent with C&ME's commercial and services land use classification. Transco would adhere to all C&ME policies for use of the property. No ground excavation is proposed, and all project-related materials would be removed from the site following construction. The Rockaway Project would have no impact on the existing land use or land cover on the property.

It is expected that the marine construction contractor for the Rockaway Project may use additional established docks and marinas on private lands to load or unload personnel and supplies, but Transco does not anticpate the need for any additional private land to support pipeline construction beyond the pipe yard discussed above.

As noted above, construction activities at Compressor Station 195 would affect about 25.2 acres within the existing station site. All of this land is privately owned by Transco.

4.8.3 Coastal Zone Management

In 1972, Congress passed the CZMA to "preserve, protect, develop, and where possible, to restore or enhance, the resources of the nation's coastal zone" and "encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone" (16 USC 1452, Section 303 [1] and [2]). Section 307 (c)(3)(A) of the CZMA states that "any applicant for a required federal license or permit to conduct an activity, in or outside the coastal zone, affecting any land or water use or natural resource of the coastal zone of that state shall provide a certification that the proposed activity complies with the enforceable policies of the state's approved program and that such activity will be conducted in a manner consistent with the program."

The proposed aboveground facilities and the majority of the HDD section of the pipeline would be located within the GNRA. Federal lands, such as the GNRA, are excluded from state coastal zones as stated in the Coastal Zone Management Program (CZMP) Regulations (15 CFR §923.33[a]). According to Title 15 CFR §923.33(b), "the exclusion of Federal lands does not remove Federal agencies from the obligation of complying with the consistency provisions of Section 307 of the Act when Federal actions on these excluded lands have spillover impacts that affect any land or water use or natural resource of the coastal zone within the purview of a state's management program."

In order to participate in the CZMP, a state is required to prepare a program management plan for approval by NOAA's Office of Ocean and Coastal Resource Management (OCRM). Once the OCRM has approved a state's plan including its enforceable program policies, the state program gains "federal consistency" jurisdiction. This means that any federal action (e.g., a project requiring federally issued licenses or permits) that takes place within the state's coastal zone must be found to be consistent with state coastal policies before the action can take place.

The NYSDOS, through the Division of Coastal Resources, is the lead agency responsible for administering the State's Waterfront Revitalization and Coastal Resources Act, Section 919, as approved by NOAA in 1982. This act provides the NYSDOS with the authority to establish a coastal management program, develop coastal policies, define coastal boundaries, and establish state consistency requirements. The New York Coastal Management Program (CMP) requires actions within the coastal zone to be consistent with the state's coastal area policies or a state-approved Local Waterfront Revitalization Program (LWRP). A LWRP is a refinement of the state's coastal policies, developed jointly by the state and a municipality. In 2002, the Secretary of New York State and the U.S. Secretary of Commerce approved the New Waterfront Revitalization Program as New York City's official LWRP, which is the city's principal coastal zone management tool. The LWRP establishes city policies for development and use of the waterfront and provides the framework for evaluating the consistency of all discretionary actions in the coastal zone with those policies (New York City Department of City Planning, 2002).

The Rockaway Project is subject to a federal Coastal Zone Consistency Review because it would involve activities within the coastal zone of New York, and require several federal permits and approvals. Transco consulted with the NYSDOS for review of the Rockaway Project under New York State CMP and LWRP policies. Transco prepared a consistency assessment with an addendum that concluded that the Rockaway Project would not have a significant adverse impact on coastal resources and would be consistent with the applicable policies of the LWRP.

Transco filed its original consistency assessment with the NYSDOS on January 7, 2013. The NYSDOS stayed its review of the assessment for a 60-day period beginning on July 30, 2013, for a 95-day period beginning on September 1, 2013, and for a 14-day period beginning on December 5, 2013. On October 10, 2013, during the second stay, Transco filed an addendum to its original assessment to provide additional details on surface water use, beach use, and potential visual effects during construction. On November 12, 2013, the NYSDOS requested that Transco prepare and submit a plan for stakeholder outreach (especially directed at beach users) prior to the end of the third stay of the review period. In response, Transco submitted an *Outreach Plan for Offshore Construction* to the NYSDOS on December 17, 2013 (see Section 4.8.7 below and Appendix P). The NYSDOS subsequently concurred with Transco's consistency assessment on December 26, 2013.

Transco proposes to use a commercial pipe yard in Elizabeth, New Jersey that is within the coastal zone administered by New Jersey. Since the site is an existing commercial/industrial yard and Transco's proposed use would be consistent with the purpose for which the commercial yard exists, no coastal zone management consistency review is required in New Jersey.

4.8.4 Offshore Uses

4.8.4.1 Fishing

The nearshore waters of the New York Bight produce significant quantities of commercially and recreationally important fish and shellfish. The top five commercial fish species, in terms of dollars, for nearshore New York State waters in 2010 included a finfish, striped bass (*Morone saxatilis*), and four shellfish, Atlantic surfclam (Spisula solidissima), Atlantic blue crab (*Callinectes sapidus*), Loligo squid (*Loligo pealei*), and American lobster (*Homerus americanus*) (NOAA, 2010). While data from NOAA Fisheries indicates that the proposed pipeline would not cross any federally designated or state-designated shellfish lease areas, it would be in an area of the Atlantic Ocean that is certified by New York State as being safe for shellfish harvesting.

Atlantic surfclam is an important shellfish species for commercial use in the vicinity of the Rockaway Delivery Lateral. There are no seasonal restrictions on surfclam harvests in certified New York State marine waters. Horseshoe crab (*Limulus polyphemus*) is an arthropod that is harvested in the ocean waters off the Rockaway Peninsula for bait and as a biomedical resource. Most horseshoe crab harvests (more than 86 percent) occur in hand, trawl, and dredge fisheries; other methods include gill nets, pounds, and traps (Eyler et al., 2011). Dredges cannot be used to harvest horseshoe crabs from the Atlantic Ocean except in September and October (Eckel, 2010).

Marine fish species important to the commercial and recreational fishing industries in New York waters include striped bass, bluefish (*Pomatomus saltatrix*), summer flounder (*Paralichthys dentatus*), scup (*Stenotomus chrysops*), and black sea bass (*Centropristis striata*) (NOAA, 2010 and 2011). Commercial and recreational fishing seasons for these species are identified in Table 4.8.4-1. A fishing area known as "scallop ridge" lies approximately 0.25 mile south of the existing LNYBL, outside the temporary workspace proposed for offshore construction. A designated fish haven known as the Rockaway Reef is located about 0.65 mile east of the proposed pipeline and outside the temporary construction workspace.

TABLE 4.8.4-1
Fishing Seasons for Several Managed Fish Species in the Vicinity of the Rockaway Project

Species	Commercial Season [a]	Recreational Season [a]
Striped bass (*Morone saxatilis*)	July 1 to December 15	April 15 to December 15
Bluefish (*Pomatomus saltatrix*)	All Year	All Year
Summer flounder (*Paralichthys dentatus*)	All Year	May 1 to September 30
Scup (*Stenotomus chrysops*)	All Year	May 1 to December 31
Black sea bass (*Centropristis striata*)	All Year	June 15 to December 31

Sources:
[a] New York Environmental Conservation Law, Section 40.1

As discussed in Section 4.6.3.2, based on modeling results, Transco's refinement of the project design (e.g., the decrease in the width of the offshore workspace) would result in a reduction in the extent of offshore turbidity and sedimentation impacts relative to the assessment provided in the draft EIS. This reduction is expected to also reduce impacts on fish species.

Construction of the Rockaway Delivery Lateral would impact benthic shellfish in the excavated or jetted areas and adjacent workspaces that may be subject to heavy sedimentation. In these areas, the pipeline would affect an Atlantic surfclam aggregation that was identified and revisited during Transco's 2009 and 2010 environmental surveys (see Figure 4.5.2-1). The number of surfclams that would be impacted is relatively small and the community is expected to recover shortly after construction (also see the discussion of shellfish impacts in Section 4.6.2). As noted elsewhere, Transco would mitigate for any short-term loss of surfclams by coordinating with the New York surfclam fishing community to see if it is possible to harvest in the vicinity of the Rockaway Delivery Lateral in the months immediately prior to construction. Additionally, we are recommending in Section 4.6.3.2 that Transco file a post-construction benthic sampling and monitoring plan for the subsea pipeline to ensure that benthic communities recover as expected. For all these reasons, no significant or long-term impacts on surfclam harvests are expected. Similar impacts on horseshoe crab and bottom-dwelling fish populations (e.g., flounder) could occur, but these species have greater mobility than surfclams, and may be able to avoid the area of disturbance.

Other commercially or recreationally important fish species in the vicinity of the Rockaway Delivery Lateral would likely avoid the areas of greatest disturbance and would experience temporary, minor impacts from increased levels of suspended sediment and turbidity. These impacts would be spatially limited and would affect few individuals relative to overall populations within the area. In addition, the proposed pipeline route has been located, to the maximum extent practical, to avoid hard-bottom habitat that supports shellfish and fish communities. Therefore, we do not anticipate any significant impacts on the fish populations available for commercial harvest or recreational catch. See Section 4.3.2 for further discussion of project-related turbidity and sedimentation, and Section 4.6 for further discussion of the effects of the Rockaway Delivery Lateral on shellfish and finfish populations.

Additional short-term impacts on the commercial and recreational fishing industry could occur during offshore construction. In this period, commercial and recreational vessels not associated with the Rockaway Project would be advised to avoid a 2.55-mile-long, 0.95-mile-wide safety zone established around the temporary offshore work area. The safety zone would begin 0.5 mile from shore and extend 1,000 feet beyond the existing pipeline approximately 3.0 miles from the Rockaway shoreline. The zone would be marked by a network of 14 buoys placed along the perimeter of the area at a spacing of 0.5 mile. Each buoy would be a 24- by 60-inch general purpose can buoy with a 1-mile clear flashing solar light or similar. Transco would employ a full-time (24-hour) escort boat to intercept non-project vessels and dissuade them from entering the safety zone. In addition, three project tug boats would also

be available to assist the picket boat during periods of high traffic. Non-project vessels approaching the work area would be met by a project vessel, informed of the work taking place, dissuaded from entering the workspace, and guided to an alternate safe route around the work area. Non-project vessels seeking to move along the coast (east/west direction) would be directed through the 0.5-mile area of the ocean between Rockaway Beach and the safety zone. Non-project vessels traveling seaward of the safety zone would be directed around the safety zone 3.0 miles seaward of the shoreline.

Fishing activities would also be affected during pipeline commissioning activities, which would occur over a 2-week period at the end of construction prior to placing facilities in-service. During this time, Transco would advise fishermen to avoid the area centered on the subsea manifold near the tie-in with the LNYBL with a radius of 2,500 feet.

For both construction and commissioning activities, Transco would submit a Special Notice to Mariners to the USCG to advise vessels of the construction schedule and the location of the restricted areas.

Transco would advertise its plans and schedule to allow commercial fishermen to remove any fixed fishing gear from the construction area before construction begins. In addition, Transco would work with the New York surfclam fishing community to coordinate a harvest in the proposed offshore work area in the months prior to construction. Because offshore construction is scheduled to begin no sooner than spring, impacts on the fishing community could be minimized because the NYSDEC surfclam harvest quota system adheres to an annual cycle beginning in January. Surfclam trawlers would have a few months to harvest the project area before construction. Harvesting the area before construction would minimize the potential for conflicts with surfclam vessel operators during construction and reduce the amount of surfclams that might be harvested from other areas, which in turn would reduce the short-term cumulative impact of the Rockaway Delivery Lateral on the surfclam population.

Following construction, there would be no restrictions on fishing, except during routine scheduled pipeline maintenance inspections or if there is an unexpected need to repair the pipeline. Routine pipeline maintenance inspections would take place approximately once every 7 years at the subsea tap near the tie in with the LNYBL, and would require approximately 5 days to complete. During this time, commercial and recreational vessels would be advised through a Special Notice to Mariners of the work taking place and the location of the restricted work zone, which would be centered over the subsea manifold and have a radius of approximately 1,500 feet. During normal operations, the offshore pipeline is not expected to have a long-term impact on fishing activities or fishing equipment. The pipeline would be installed at least 4 feet below the seafloor and would be buried during the trench backfill (see Sections 2.3.1.9, 4.1.7, and 4.6.3).

4.8.4.2 Vessel Traffic

In addition to the fishing activities discussed above, vessel traffic in the New York Bight waters off the Rockaway Peninsula includes both commercial shipping and recreational boating. The Rockaway Project is expected to have little, if any, impact on commercial shipping for the following reasons:

1. there are no major ports located within 10 miles of the pipeline route;
2. although the proposed Rockaway Delivery Lateral is within the precautionary area of the Port of New Jersey and New York, there are no shipping routes or navigation channels crossed by the pipeline route; and
3. there are no designated lightering zones (i.e., designated locations for anchoring and ship-to-ship transfer operations) crossed by or in the vicinity of the pipeline route.

Impacts on commercial ship traffic would be short term and mainly limited to the 2.55-mile-long, 0.95-mile-wide safety zone around the temporary workspace that would be used for offshore construction and the circular area with a radius of 2,500 feet that would be used during commissioning of the pipeline. Additionally, as indicated in Section 4.8.4.1 above, vessels would be advised to avoid the safety zones during the offshore construction period and the commissioning period. A Special Notice to Mariners would be submitted to the USCG to advise commercial vessels of the construction schedule and location of the restricted area, which would be marked by buoys and monitored by escort boats. These temporary restrictions are not expected to adversely effect commercial shipping because there is ample room in the surrounding area for ships to transit to and from local harbor destinations. Additionally, there would be constant communication between construction vessels and other boat traffic to ensure that adequate safety margins are maintained.

Offshore construction during the spring and summer months is not expected to result in greater impacts on commercial ship traffic relative to other seasons of the year. USCG tracking data from 2009 and 2010 for larger vessels equipped with automatic identification system transponders indicate that approximately 6 to 17 of these vessels cross the project area each month, most of which are transiting to or from the East Rockaway Inlet. A comparison of these tracks for July and November suggests that there is no significant change in larger vessel traffic during the summer.

Minor recreational boat traffic is expected in the vicinity of the offshore pipeline because there are no public or private marinas, protected coves, inlets, or harbors within or near the proposed pipeline landfall. Any recreational boating that does occur in the area would be subject to the same restrictions imposed on other vessels (see more discussion of these restrictions above). Recreational boaters would have access to the same Special Notice to Mariners that would be available to fishermen and commercial ships. Therefore, no significant impacts on recreational boating are expected.

Table 4.8.4-2 lists the estimated project vessel sizes and traffic between the offshore construction site and either a dock or the pipe yard at the C&ME facilities in Elizabeth, New Jersey. Construction-related vessel traffic along the waterways between the proposed pipe yard and the offshore workspace temporarily would increase during construction, but the total number and frequency of vessel trips for the Rockaway Project would be small, typically less than 10 vessel trips per day on most days. The crew and escort boats would make daily trips between the shore and the offshore construction site. The pipe transport barges (and the four tug boats that support them) would travel between the pipe yard and the offshore construction site once per day during pipe laying activities, where one barge would be loaded at the pipe yard while the other would be used at the offshore worksite. The dive support vessel could make daily trips to and from the work area if it docks in the harbor at night, but the vessel would be capable of anchoring in the work area overnight. The fuel barge (and the tug boats that support it) would make about one trip per week to the work area to refuel vessels and equipment. The other vessels, including the clamshell barge, jack-up barge, and pipe lay barge (and associated tug boats) would remain at the offshore construction area for the duration of their work. The additon of these vessel trips is not expected to have a significant impact on commercial vessel traffic or channel congestion.

Restrictions on recreational and commercial vessel traffic during operation of the Rockaway Delivery Lateral would be the same as for fishing vessels. Specifically, recreational boats and commercial vessels would be advised to avoid a small area in the vicinity of the subsea hot-tap for a 5-day maintenance period approximately once every 7 years for internal pipeline inspections.

TABLE 4.8.4-2
Estimated Vessel Size and Trip Frequency for Construction-Related Traffic for the Rockaway Delivery Lateral [a]

Vessel Type	Number of Vessels	Vessel Size (feet)	Vessel Origin	Estimated Trip Frequency
Crew boats	2	110	Local	Twice per day [b]
Escort boats	2	110	Local	Once per day [c]
Pipe transport barges	2	150	Local	Once per day [d]
Dive support vessel	1	150	Local	Variable [e]
Fuel barge	1	100	Local	Once per week [f]
Pipe lay barge	1	400	Gulf Coast	Once for construction campaign [g]
Clamshell barge	1	150	Local	Once for construction campaign [h]
Jack-up barge	1	130	Gulf Coast	Once for construction campaign [i]
Tug boats	7	75	Local	Variable [j]
Anchor handling tug boats	2	150	Gulf Coast	Once for construction campaign [k]

[a] Data provided in this table are Transco estimates; final contractors and vessels have not been selected.

[b] Two crew boats would be available, but just one would typically be operating at any given time during the day. Each crew boat would facilitate shift changes and supply runs approximately one per day. Trip frequency is for the duration of offshore construction.

[c] Two escort boats would be available, but just one would typically be operating at any given time during the day. Trip frequency is for the duration of offshore construction.

[d] Two pipe transport barges would be utilized. Each pipe transport barge would be transported to the offshore worksite once per day for the duration of offshore pipe laying activities. One pipe lay barge would be used at the offshore work site while the other is loaded with pipe at the pipe yard.

[e] The dive support vessel would make daily trips to the work site if it docks in the harbor, but would be capable of anchoring in the work area over night. A dive support vessel would also be used for pre-commissioning/commission activities. Trip frequency is for the duration of offshore construction.

[f] Trip frequency is for the duration of offshore construction.

[g] Trip frequency is for the duration of offshore pipe laying and HDD activities.

[h] Trip frequency is for the duration of offshore clamshell dredging.

[i] Trip frequency is for the duration of the HDD operation.

[j] Two tugs would be used in conjunction with each pipe transport barge (a total of four tugs), which would make daily trips between the pipe yard and offshore work site. One tug would be used to transport the clamshell barge to the work site and to assist with positioning each day the clamshell barge is operating. One tug would be used to transport the fuel barge to and from the offshore worksite approximately once per week. One tug may be used to assist with positioning the dive support vessel. When not in use or at dock, tugs would be rafted to construction vessels. Trips frequency for tugs is dependent on the trip frequency of the vessels supported by the tugs.

[k] Two anchor handling tugs would be used to move and position anchors during construction. When not in use these tugs would be rafted to construction vessels. Trip frequency for tugs is dependent on the trip frequency of the vessels supported by the tugs.

4.8.4.3 Subsea Utilities

NOAA navigation charts and Transco's magnetometer survey data for the Rockaway Delivery Lateral indicate that the offshore pipeline would cross one active and two inactive subsea cables (see Figure 4.8.4-1). One of the inactive cables is believed to be the Cape Cod to New York telegraph, which was installed in 1899 for the French Telegraph Cable Company. The other is believed to be the New York to Fisherman's Point (Cuba) telegraph, which was installed in 1907 for the Central and South American Telegraph Company.

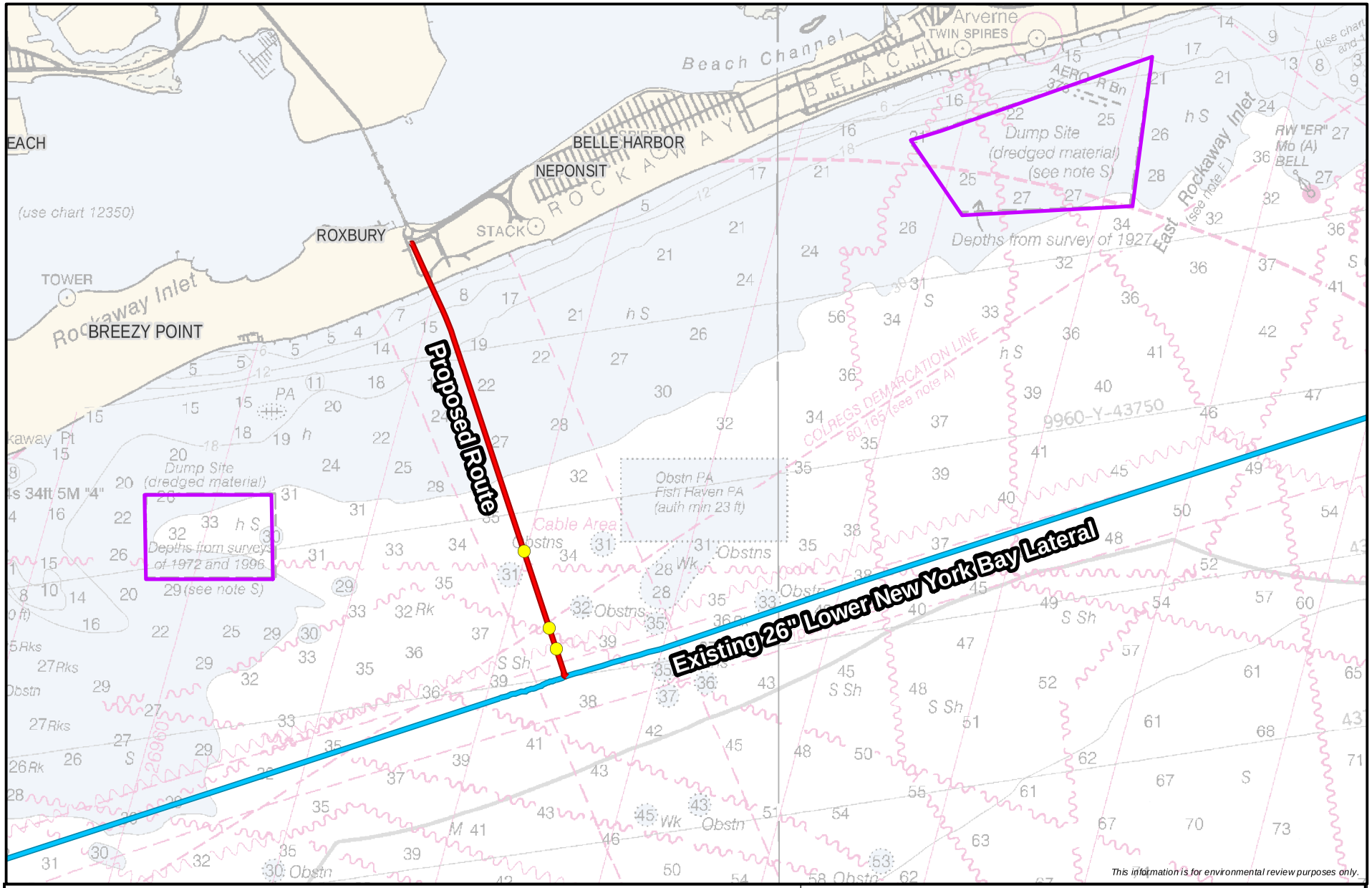

Figure 4.8.4-1
Rockaway Delivery Lateral and Northeast Connector Projects
Locations of Cable Crossings and Dumping Grounds in Relation to the Rockaway Delivery Lateral

The active cable is part of the Neptune RTS, which was completed in 2007 to transmit high-voltage direct current electric power for 65 miles between Sayreville, New Jersey and New Cassel on Long Island, New York. As-built drawings of the cable indicate it is buried approximately 5 feet below the seabed, but information provided by Transco suggests that it is buried at a depth of 9 feet below the seabed at the proposed pipeline crossing.

Transco developed an installation plan (*Neptune Cable Crossing Procedure*) for the active cable crossing (see Section 2.3.16), and is currently finalizing the details of this plan with its construction contractor. The plan assumes that the cable is buried at a depth of 9 feet below the seabed at the proposed pipeline crossing, and that Transco would maintain 18 inches of separation between the cable and the pipeline with 4 feet of cover over the pipeline. The plan includes a contingency in the event that the cable is buried less than 8 feet below the seabed. Under the contingency, the pipeline would be buried with less than 4 feet of cover where it crosses over the cable, but concrete mats would be placed over the pipeline at the crossing location. After the installation plan for the active cable is finalized, Transco would submit it to the owner of the cable for review before beginning pipeline construction near the crossing.

Because the installation plan has not been finalized, **we recommend that:**

- **Prior to construction of the offshore portion of the Rockaway Delivery Lateral, Transco should file with the Secretary a finalized crossing plan for the Neptune RTS cable and documentation of consultation with the cable owner regarding the plan. In the event that Transco is unable to maintain a minimum of 18 inches of separation between the pipeline and the subsea cable, as well as 4 feet of cover over the pipeline, Transco should also file documentation that the USACE approves of its contingency plan.**

No special construction methods or techniques are required for the crossings of the inactive subsea cables.

4.8.4.4 Offshore Dredge Disposal Sites

Two offshore dredged material disposal sites are located in the vicinity of the Rockaway Delivery Lateral (Figure 4.8.4-1). The East Rockaway Inlet, Long Island, New York, Dredged Material Disposal Site is located off of the Rockaway Peninsula shore approximately 3.4 miles northeast of the proposed pipeline route. It is 0.81 square nautical mile (nm^2) in size and 0.21 statute mile from the nearest shore (EPA, 2012b). Disposal at the site is restricted to dredged material from the East Rockaway Inlet. The second site, the Rockaway Inlet, Long Island, New York, Dredged Material Disposal Site is located off of the Rockaway Peninsula shore approximately 1.6 statute miles southeast of the pipeline route. It is approximately 0.38 nm^2 in size and 0.6 statute mile from the nearest shore. Disposal at this site is restricted to dredged material from the Rockaway Inlet (40 CFR 228.15).

The USACE has not used either of these dredge disposal sites in recent years. Instead, material dredged from the Rockaway and East Rockway Inlets is used for beach replenishment along the Rockaway Peninsula (USACE, 2012a), restoration fill for Jamaica Bay, and capping of an "historic area restoration site" south of the Ambrose Light off of the New Jersey shore (USACE, 2012b).

As discussed in Section 4.2.2, sediment samples were collected and analyzed from four locations along the offshore portion of the pipeline route (Ecology and Environment, Inc., 2011). With one exception, no evidence of elevated contamination levels was identified in the samples. One sample

yielded an elevated concentration of mercury, but the concentration was slighly higher than the TOGS 5.1.9 Class A threshold for this metal. Therefore, we do not anticipate any issues related to resuspension of mercury into the water column, and no impacts from the dredge disposal sites are expected. Additional information on the results of the sediment sampling and analysis is provided in Section 4.2.2 and Appendix I.

4.8.5 Hazardous Waste Sites and Landfills

We conducted a search of publicly available databases in the EPA's Envirofacts Data Warehouse to identify hazardous waste sites and landfills in the vicinity of the proposed Rockaway Project facilities and Compressor Station 195. As noted in Section 4.2.2, the New York City Fire Department Engine Company 329, located approximately 200 feet southeast of the HDD entry point, is the sole EPA-regulated facility within 0.5 mile of the Rockaway Project, and Compressor Station 195 is the sole EPA-regulated facility within 0.5 mile of this area. Because Engine Company 329 and Compressor Station 195 are in compliance with the permits issued by the EPA, we do not anticipate that Transco would encounter any known or previously identified soil contamination associated with these facilities.

We received a comment from the NPS that a tar-like substance associated with an old factory site is located on the south shore of Floyd Bennet Field east of the Marine Parkway Bridge. We have determined that this site is located about 0.7 mile from the proposed M&R facility and would not be affected by construction of the Rockaway Project. Our search did not identify any known contamination sites in the vicinity of the Projects, including in the offshore area.

Transco conducted site evaluations at the proposed M&R facility site and tested offshore sediments along the route for the Rockaway Delivery Lateral for contamination. The results of these studies are discussed in Sections 4.2.2 and 4.3.2.2.

4.8.6 Existing Residences and Buildings

There are no residences within 50 feet of the proposed construction work areas for the Rockaway Project. Residential communities in the vicinity of the Rockaway Delivery Lateral include Roxbury, approximately 0.3 mile to the west, and Neponsit and Belle Harbor, approximately 1.0 mile to the east. The closest residence to the M&R facility is a multi-family residential building off Aviation Road, approximately 0.5 mile to the southeast.

The proposed pipeline would not cross under any buildings in Jacob Riis Park. The M&R facility would be located in a historic hangar complex (Hangars 1 and 2) in Floyd Bennett Field, which would be rehabilitated to ensure structural integrity and to enhance the visual aesthetics of the Floyd Bennett Field Historic District. The temporary workspace would be within 50 feet of Hangars 3 and 4 to the north and a historic garage and maintenance shop to the south. These buildings currently are in disrepair and appear to be used for storage of unused supplies and derelict equipment and for boats. Because of its location within Jacob Riis Park and TBTA property, the onshore portion of the proposed pipeline route would not cross any planned residential developments. Similarly, the M&R facility would be located in the GNRA and would not lie within any planned residential developments.

Other than rehabilitation and reuse of Hangars 1 and 2 for the M&R facility, no buildings would be affected by the Rockaway Project. As discussed in Section 4.11.2.3, residences closest to the HDD entry and the M&R facility sites may experience an increase in noise during construction. Transco would erect barriers during HDD activities to mitigate the noise from the drill and other machinery on TBTA

property. In addition, Transco would configure the onshore HDD workspace, storage tanks, trailers and other non-noise-producing equipment in a manner that keeps the noisiest equipment and activities as far as possible from noise-sensitive areas. Construction at the M&R facility would take place during daytime hours when there is less sensitivity to noise. Residents would not be impacted by operation of the Rockaway Project.

Construction activities at Compressor Station 195 would be confined to the existing station yard, so no planned future residential developments would be affected by the Northeast Connector Project. There are no residences within 50 feet of the proposed construction workspace, but there are several homes in the vicinity of the site that could experience an increase in noise during construction and operation of the facilities. Construction at Compressor Station 195 would take place during daylight hours when there is less sensitivity to noise. As discussed in Section 4.11.2.3, the noise levels at Compressor Station 195 during operations could exceed the FERC standard of 55 dBA at the nearest NSA, but the noise level would be less than measured values for current ambient conditions at the site.

4.8.7 Recreation and Special Use Areas

Impacts of the Rockaway Project on the GNRA and Jacob Riis Park are discussed below. Activities at Compressor Station 195 would not affect recreation and special use areas.

Gateway National Recreation Area

The GNRA was added to the NPS system in 1972. It encompasses more than 26,000 acres in New York and New Jersey. Specifically, it includes areas in Brooklyn, Queens, and Staten Island in New York, and Monmouth County, New Jersey. Figure 4.8.7-1 shows the location of the Rockaway Project area in the GNRA.

The GNRA attracts more than 9 million visitors a year, making it the third most visited national park in the United States. Peak season for the park is generally considered to extend from Memorial Day to Labor Day. The park provides both active and passive open space recreation opportunities ranging from swimming and boating to bird watching and hiking. The GNRA is separated into three administrative units based on their geographic locations around New York City's Outer Harbor: Jamaica Bay, Staten Island, and Sandy Hook. The Rockaway Project area is located within the Jamaica Bay Unit. This unit includes 6,192 acres of upland, 1,000 acres of salt marshes, and 11,350 acres of bay and ocean bottom. Visitor activities in the Jamaica Bay Unit include swimming, nature walks, sailing, bicycling, bird watching, gardening, camping, astronomy, and fishing. Offshore, the Rockaway Delivery Lateral would cross 0.25 mile of the GNRA. The pipeline would not cross Jamaica Bay or any salt marshes within the unit (NPS, 2009).

The GNRA is managed by the NPS pursuant to a GMP which was first published in 1979. The NPS currently is in the process of developing a new GMP, which will provide management direction and guide decision making for the GNRA over the next 20 years. A draft of the updated GMP/EIS was issued by the NPS for public comment on August 2, 2013. The updated draft GMP/EIS prescribes a means of managing and using existing facilities and resources within the GNRA to obtain maximum recreational and educational benefits while continuing to protect natural and cultural resources. The new GMP/EIS is expected to be finalized by the spring of 2014.

Jacob Riis Park

The proposed pipeline would cross 0.57 mile of land within GNRA boundaries. Of this, 0.32 mile would be located onshore within Jacob Riis Park (see Figure 4.8.7-1). The park was opened in 1932 and transferred to the NPS as part of the creation of the GNRA in 1972. Jacob Riis Park provides both active and passive open space recreation facilities, including the Riis Park Pitch-and-Putt Golf Course, a playground, picnic area, beach, swimming area, boardwalks, courtyards, landscaped walkway, food concessions, and a historic bathhouse. The pipeline would cross a section of the beach, boardwalk, and pitch-and-putt golf course during peak season. This area includes the GNRA land use classifications of beach, development support, protection, and structured recreation, and the land cover classifications of barren land, grassland/herbaceous, open space, and developed. In the updated draft GMP/EIS for the GNRA, this area is within a recreation management zone and an active beach subzone (NPS, 2013).

Impacts on Jacob Riis Park would be minimized by Transco's use of the HDD construction method, as no ground disturbing activities would occur in the park. It is possible that use of the golf course at the park could decline for a temporary, short-term period during the spring/summer of 2014 as a result of construction noise at the HDD entry point. To help mitigate this potential effect, Transco would erect tents and/or screens around the HDD machinery on the TBTA property adjacent to the park to mitigate noise. Construction noise due to operation of the HDD equipment at the entry site would be less than 55 dBA in the vicinity of the beach and would not likely affect users of the beach. Additional information on noise impacts is provided in Section 4.11.2.

During the HDD crossing, there is the potential for ground surface disturbance if an unanticipated, inadvertent release of drilling fluid surfaces along the HDD alignment. An inadvertent release of drilling fluid in Jacob Riis Park could temporarily affect park users. To minimize the potential for this, Transco would install a 200-foot-long casing at the HDD entry point on the TBTA property and implement its HDD Monitoring and Contingency Plan, which includes measures to contain and clean up any release that may occur onshore (see Appendix H).

The greatest impact on users of the park would likely be related to aesthetics during the peak visitor season as equipment and other activities would be visible during construction. As noted above, Transco prepared an *Outreach Plan for Offshore Construction* directed towards beach users at the request of the NYSDOS. Under the plan, Transco would communicate information regarding offshore construction activities to beach users via signs, a website, newspaper advertisements, and public information sessions (if warranted). A copy of the plan is provided in Appendix P. A discussion of impacts on visual resources is provided in Section 4.8.8.

We received a comment from a stakeholder regarding the need for an evacuation plan for Rockaway Beach in the event of an inadvertent release of drilling fluid on the beach or in the nearshore area. Typically, evacuation would be unnecessary in the unlikely event that this occurs. Transco would cordon off the affected area and remove the drilling mud in accordance with its HDD Monitoring and Contingency Plan (see Appendix H).

Transco has proposed a permanent 50-foot-wide right-of-way over the pipeline across Jacob Riis Park and the offshore area under GNRA jurisdiction. During operations, Transco would periodically walk and inspect the onshore right-of-way and conduct leak detection surveys once a year, but no alterations would be made to the land cover during these inspections. Additionally, there would be no restrictions on existing uses of the Park along the right-of-way. Therefore, the Rockaway Project would have no impact on current land uses or land cover within Jacob Riis Park. Construction of new buildings within the permanent pipeline right-of-way would be prohibited.

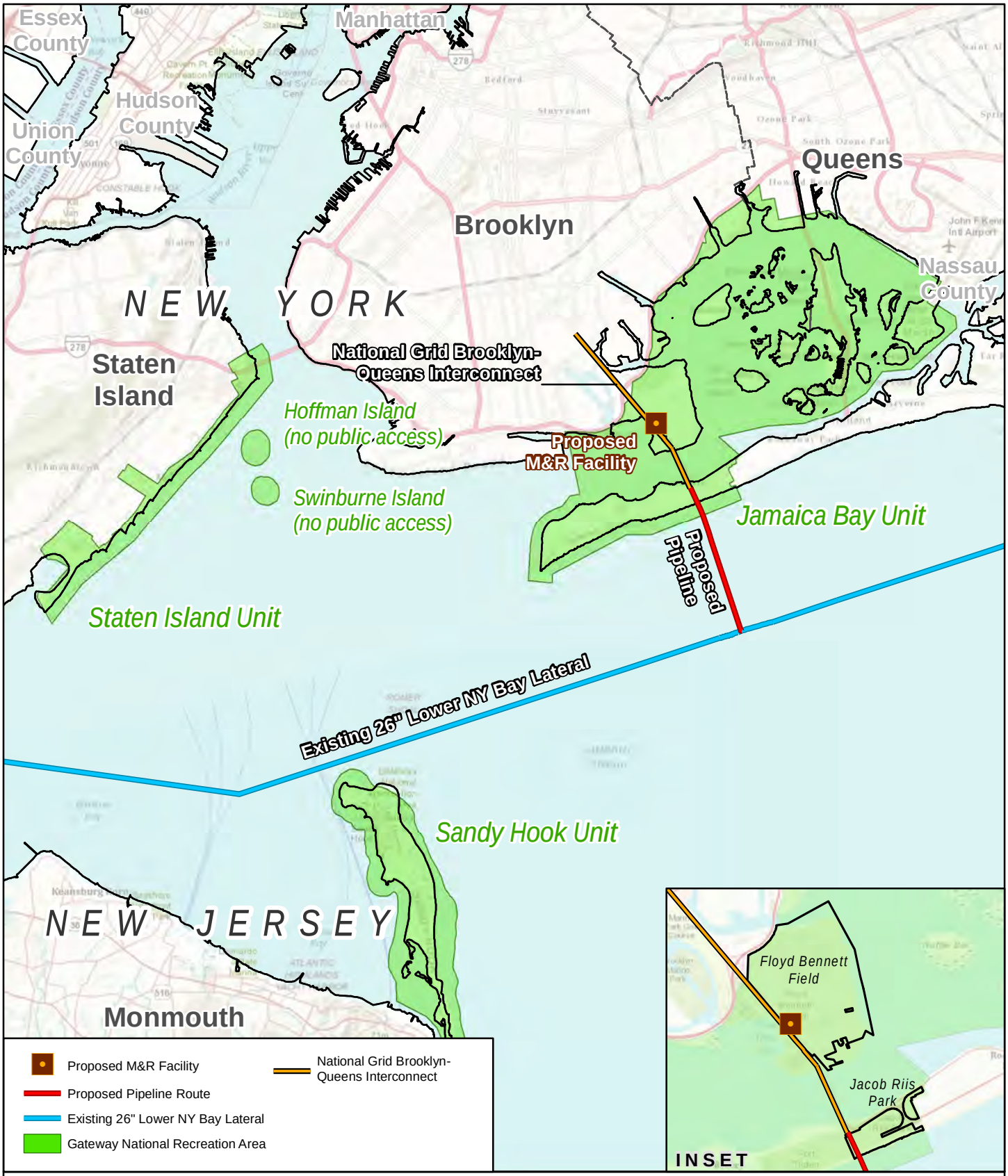

Figure 4.8.7-1
Rockaway Delivery Lateral
and Northeast Connector Projects
Gateway National Recreation Area
in Relation to the Rockaway Project

Floyd Bennett Field

The proposed M&R facility would be located within Floyd Bennett Field (see Figure 4.8.7-1). This field was New York City's first municipal airport, and it was used publicly until 1941 when it was sold to the U.S. Navy. In 1946, it became a Naval Air Reserve Training Station and then a Naval Air Station, before being deactivated in 1971 and incorporated into the GNRA (NPS, 2012). Portions of Floyd Bennett Field are still used as a helicopter base by the New York City Police Department, but the field otherwise is no longer used as a commercial or military airport. The Rockaway Project is not expected to affect the use of the field as a helicopter base; the heliport/landing strip is located on the eastern shore of Floyd Bennett Field approximately 0.7 mile from the proposed M&R facility site.

Floyd Bennett Field currently provides activities for visitors similar to those listed above for Jacob Riis Park, including nature walks, bicycling, bird watching, camping, and astronomy. The area of the field that would be impacted by the Rockaway Project includes the GNRA land use classifications of Gateway Village (for the M&R facility) and use-by-reservation, structured recreation, and unstructured recreation (for the access road). The land cover that would be affected by construction and operation of the M&R facility is developed. In the updated draft GMP/EIS for the GNRA, this area is within a historic management zone (NPS, 2013).

The M&R facility would be constructed within a 1.1-acre historic hangar complex (i.e., Hangars 1 and 2). Approximately 5.5 acres would be directly affected by construction of the M&R facility, including Hangars 1 and 2, a fenced area for parking and equipment lay-down, and access roads. The hangar complex currently is in disrepair. It has been used most recently by the NPS as a storage area for unused supplies and equipment and by emergency response teams after Hurricane Sandy. With the permission of and in coordination with GNRA staff, Transco cleaned out the hangars in order to complete the historical, structural, and SIs necessary to evaluate the feasibility of using the building as an M&R facility. Because access to the hangar complex has been restricted by the NPS due to safety concerns, construction activities would not impact any current uses of the site.

The rehabilitation of the hangars and installation of the M&R equipment would occur over a 14 month period (six months for installation of equipment and piping and up to 14 months for rehabilitation of the structures). During this time, existing paved areas around the hangar complex would be used as a temporary workspace. Ground disturbance would be necessary to install support piles for the building foundation, but pavement would be restored following construction. Construction and worker vehicles would access the site along the Aviation Road entrance, which could contribute to occasional minor increases in traffic.

We received several comments from stakeholders regarding potential impacts on the community garden at Floyd Bennett Field. The garden is located approximately 260 feet to the northeast of the hangars. Temporary workspace for construction of the M&R facility would be within 100 feet of the nearest garden plot. Gardeners would be temporarily disturbed by noise, vibration, and traffic during construction. In addition, construction noise also could disturb users of the Ecology Village Campsite on Floyd Bennett Field, which is located within 0.5 mile of the hangar complex, but these disturbances would be less noticeable and limited to daylight hours (see Section 4.11 for further discussion of noise impacts).

Operation of the M&R facility would require the use of approximately 2.0 acres of land, including the lease of the hangar complex and the establishment of two permanent right-of-way easements, measuring 56 and 60 feet in width, for the inlet and outlet piping that would connect to the National Grid pipeline along Flatbush Avenue. GNRA traffic would not be significantly impacted by

operation of the M&R facility. The facility operations generally would be automated so vehicle trips and parking requirements for company personnel would be limited to occasional inspection, maintenance, and repair visits. For safety purposes, the M&R facility design would incorporate low illumination lighting. Transco does not anticipate that this lighting would be visible from the nearby Ecology Village Campsite. The noise study concluded that the increase in noise due to operation of the M&R facility is unlikely to be noticeable above ambient conditions (Hoover & Keith, Inc., 2012b). Therefore, we do not anticipate any significant impacts on Floyd Bennett Field users from operation of the M&R facility.

We received several comments from stakeholders regarding Transco's proposed use of Hangars 1 and 2 for the M&R facility, including that the M&R facility would be an inappropriate use for the hangar structures. The NPS may issue a lease of lands under its jurisdiction for any lawful purpose, subject to 36 CFR 18.4. This regulation requires that the NPS make certain determinations prior to issuing a lease, chiefly that the lease will not degrade the purposes of the park area, the property is used in a manner consistent with the purposes established by law for the park area, the lease requires at least fair market value rent, and the lease adequately insures preservation of historic property. Based on these regulations, the NPS has determined that issuance of a lease for the proposed M&R facility within Hangars 1 and 2 meets the definition of appropriateness. In addition, the New York SHPO has reviewed Transco's Schematic Design for the M&R facility, and concurred that the proposed work at Hangers 1 and 2 appears to meet the Secretary of the Interior's *Standards for Rehabilitation*. A discussion of Transco's proposed rehabilitation plan for the hangars is provided in Section 4.10.1.

Jamaica Bay

During the scoping period, and in comments on the draft EIS, we received comments regarding impacts on Jamaica Bay, including impacts on ongoing restoration activities within the bay. The offshore portion of the Rockaway Delivery Lateral would be constructed in the Atlantic Ocean off Rockaway Beach. No portion of the Rockaway Project would be constructed within Jamaica Bay; thus, Jamaica Bay would not be impacted.

4.8.8 Visual Resources

Construction of the Rockaway Delivery Lateral would impact the visual character of the Rockaway Peninsula during the time it would take to construct the offshore pipeline and complete the HDD operation. Onshore construction activities at the HDD entry location would be visible from residential neighborhoods, some area roadways, and from Jacob Riis Park and Fort Tilden in the GNRA. Transco would minimze the visual impact of the onshore construction activities by erecting a tent and/or screens to shield the HDD equipment from view. Offshore, the barges and support vessels used in trenching and pipe lay operations would be visible from the shore for a majority of the construction period, which would occur during the peak recreational use season at Rockaway Beach. However, the visual impact of these vessels would be mitigated somewhat by their distance from the beach, which would range from 0.5 to more than 2.5 miles. Visualizations of the pipe lay and jack-up barges at the HDD exit pit as observed from Rockaway Beach at 169th Street are provided in Figure 2.3.1-2; other visualizations are provided in Appendix P. Offshore construction vessels would be visible from residential neighborhoods, but the closest residences (on Beach 149th Steet) are located more than a mile from the HDD exit point and, at this distance, would appear relatively small.

Following construction, equipment and any excess materials would be removed, disturbed areas would be restored and, in the case of the HDD entry workspace, seeded with grasses. There would be no significant long-term visual impacts on the Rockaway Peninsula during operation of the pipeline. The onshore portion of the pipeline would be marked at key points to indicate the presence of the pipeline.

Transco proposes to use flush-mounted reflective plastic plate markers at a few select curb or existing pavement locations along the upland portion of the HDD route through Jacob Riis Park, including a location near the HDD entry point where the pipeline would be at a shallower depth. Typical post-style pipeline markers would not be installed on NPS land.

As discussed in Section 2.6.1, the USACE has advised Transco that it would require a sign no smaller than 4-feet by 4-feet containing language regarding the location of the pipeline at the shoreline crossing as a condition to any permit it may issue for the Rockaway Project. Transco would work with the USACE and NPS to confirm the requirements for the sign and select a design, size, and location that is acceptable to both agencies.

The hangar complex at Floyd Bennett Field that would house the M&R facility is currently in disrepair and has experienced significant structural damage. As part of the Rockaway Project, these hangars would be rehabilitated to accommodate the M&R facility. During the 14 months that Transco estimates it would take to construct the M&R facility and complete the proposed rehabilitation, the hangars and surrounding area would be visually impacted by the operation, movement, and temporary storage of equipment and materials. There would be long-term visual impact associated with the changes that must be made to the hangars to accommodate the natural gas piping and equipment, but the majority of these changes would be to the inside of the hangars and would not be visible from the exterior. We also note that Transco is proposing a rehabilitated exterior appearance that would restore the hangars' appearance and enhance the visual character of the Floyd Bennett Field Historic District in accordance with a design that would be approved by the NPS, FERC, and the New York SHPO (see Section 4.10.1). As such, no significant adverse impacts on visual resources are anticipated due to construction or operation of the M&R facility.

We do not expect construction and operation of the proposed facilities at Compressor Station 195 would impact the visual character of the surrounding area. The existing hedgerow around the periphery of the site would screen construction activities and the new facilities to views from nearby NSAs and from Bryansville Road, which runs along the northern border of the site. Although Transco would remove between 25 and 27 trees from the site during construction (see Section 4.4.1), these trees are located on the interior of the site near the existing compressor building and other facilities. Removal of these trees would not affect views from nearby NSAs or Bryansville Road.

4.8.9 Honey Bee Colonies

There are a number of managed honey bee colonies on Floyd Bennett Field, and members of the public have expressed concern that the noise and vibrations caused by operation of the M&R facility could disturb these colonies. Considerable research has been conducted to determine which frequencies of vibration affect honey bee behavior, but there is much less information available regarding the magnitudes of vibrations and noise that can cause an effect. Frings and Little (1957) found that exposure of hives to continuous sounds of certain frequencies and of sufficient intensities caused workers and drones (male honeybees) in hives to stop moving for up to 20 minutes. No reaction was observed in worker bees at the entrance to the hives or foraging in the field. This suggests that honey bees react to vibration of the surfaces on which they are walking, not to air-born sound. Frings and Little (1957) found that bees returned to normal activities almost immediately after the noise ceased. In a later paper, Little (1962) found that bees leaving or entering the hive, challenging landing bees, or ventilating the hive typically did not respond to vibrations. Additionally, queen bees were observed moving from cell to cell and laying eggs, even when workers on the same comb stood still.

Transco conducted a study (AKRF, Inc., 2013) to assess the potential effects of vibration during operations at the proposed M&R facility on the honey bee colonies at Floyd Bennett Field. Transco measured vibrations on the gas pipeline and in the ground near an existing M&R facility in Linden, New Jersey, which was determined to be comparable to the proposed M&R facility in terms of size and equipment. Transco then compared the vibration measurements from the existing M&R facility with the honey bee vibration thresholds taken from Little (1962).

The vibration measurements taken on the existing gas pipeline at the Linden facility ranged between about 90 and 110 dB at low end frequencies, but were less than 60 dB in the ground at distances ranging from 26 to 54 feet from the existing facility. The honey bee vibration thresholds taken from Little (1962) range from about 100 to 130 dB at low end frequencies. Therefore, the analysis indicates that operation of the proposed M&R facility would have no effect on the honey bee colonies, which are located about 270 feet to the east of the hangar complex.

4.8.10 Conclusion

Based on the preceding discussion, and with the implementation of Transco's proposed mitigation and our recommendations, we conclude that the Projects would not significantly affect land use, recreation, special interest areas, and visual resources.

4.9 SOCIOECONOMICS

The potential socioeconomic effects of construction and operation of the Projects include changes in population levels or local demographics, increased opportunities for employment, increased demand for housing and public services, transportation impacts, and an increase in government revenue associated with sales, payroll, and property taxes. These are discussed in Sections 4.9.1 through 4.9.6. Section 4.9.7 provides an analysis of Environmental Justice (EJ) for the Rockaway Project in accordance with CEQ guidelines (1997a) for federal agency actions. We did not prepare an EJ analysis for the Northeast Connector Project because Transco's proposed activities would be conducted at existing aboveground facility sites.

New York City is divided into 59 community districts for land use and other city planning. The onshore segment of the proposed Rockaway Delivery Lateral would traverse the Rockaway Peninsula, which is located in Queens Community District 14 (QCD14). The M&R facility would be built on Floyd Bennett Field, which is located in Brooklyn Community District 18 (BCD18). Demographic and other population statistics for the Rockaway Project are discussed by community district in the sections below. Similar statistics for the Northeast Connector Project are provided by county (i.e., York County, Pennsylvania for Compressor Station 195 and Mercer and Middlesex Counties, New Jersey for Compressor Stations 205 and 207, respectively). Socioeconomic impacts are not analyzed for the proposed pipe yard in Union County, New Jersey due to the small area and short duration of the impacts and the fact that activities at this site would be consistent with the existing use of the property.

4.9.1 Population and Employment

Rockaway Project

Table 4.9.1-1 provides a summary of select socioeconomic and demographic information for the communities that would be affected by the Rockaway Project based on 2010 census and other data. The populations of QCD14 and BCD18 in 2010 were 114,978 and 193,543, respectively. The population density was 16,425 persons per square mile in QCD14, and 21,838 persons per square mile in BCD18. Both community districts had population densities lower than their respective counties, but higher than New York State.

The civilian labor force in QCD14 and BCD18 in 2010 included approximately 160,000 people, which was about 7 percent of the total labor force (approximately 2.4 million people) in the 32 community districts in Queens and Kings Counties. The major industries within the area were reported as: educational, health, and social assistance services; professional, scientific, management, administrative, and waste management services; transportation, warehousing, and utilities; arts, entertainment, recreation, accommodation, and food services; construction; and retail trade. The per capita incomes for QCD14 and BCD18 in 2010 were $22,903 and $24,563, respectively (U.S. Census Bureau, 2012). According to the census data, the unemployment rates for QCD14 (8.1 percent) and BCD18 (8.3 percent) in 2010 were higher than the unemployment rates reported for Queens County (7.2 percent), King Counties (6.7 percent), and New York State (6.2 percent). Based on November 2013 data from the U.S. Bureau of Labor Statistics (the most recent data available), the unemployment rates for Queens and Kings Counties and New York State were 7.2, 8.7, and 6.9 percent, respectively (U.S. Bureau of Labor Statistics, 2013). [23]

[23] Monthly unemployment rates, not seasonally adjusted.

TABLE 4.9.1-1
Existing Socioeconomic Conditions in the Area and Vicinity of the Rockaway Project

State/County/ Municipality	Population [a, b]	Population Growth (Percent) (2000 – 2010) [a,b]	Population Density (persons/ sq. mile) [a,b]	Per Capita Income [b]	Civilian Labor Force [b]	Unemployment (Percent)	Top Three Sectors [b]
QCD14	114,978	0.9	16,425	$22,903	53,731	8.1 [b]	EH, TW, C
BCD18	193,543	-0.1	21,838	$24,563	105,195	8.3 [b]	EH, RT, PS
Queens County	2,230,722	0.1	20,554	$24,530	1,178,901	7.2 [c]	EH, AE, RT
Kings County	2,504,700	1.6	35,377	$23,218	1,219,822	8.7 [c]	EH, PS, RT
New York State	19,378,102	2.1	411	$30,011	9,888,442	6.9 [c]	EH, PS, RT

Sources:
[a] New York City Department of City Planning, 2011
[b] U.S. Census Bureau, 2012
[c] U.S. Bureau of Labor Statistics, 2014

Sector Key:
AE = Arts, entertainment, recreation, accommodation, and food services
C = Construction
EH = Educational, health, and social assistance
PS = Professional, scientific, management, administrative, and waste management services
RT = Retail trade
TW = Transportation, warehousing, and utilities

During construction of the Rockaway Project, Transco estimates that 130 or more construction workers would be mobilized to the area for offshore construction, and 45 or more construction workers would be mobilized to the area for onshore construction. Transco states that about 110 offshore workers and 40 onshore workers are expected to be local hires (i.e., individuals already residing in the New York City metropolitan area). Most of the estimated 25 non-local workers would be engaged in offshore construction activities and would live on the lay barge/special support vessel or in temporary housing in the vicinity of the Rockaway Project area. The influx of approximately 25 non-local workers would result in a temporary, but negligible, population increase within the Rockaway Project area. No new permanent hires would be needed to operate or maintain the proposed Rockaway Delivery Lateral or M&R facility, so there would be no permanent change in the region's population.

Construction of the Rockaway Project could temporarily decrease the unemployment rate by a minimal amount through the hiring of local workers. In addition to direct hires, it is estimated that another 122 to 160 local jobs would be affected, either as new hires or by the prevention of lay-offs, as a result of secondary economic activity associated with construction of the Rockaway Project. These jobs would result in a temporary, minor increase in employment within the area. Because no new permanent hires would be needed to operate or maintain the proposed facilities, operation of the Rockaway Project would not cause any permanent change in the unemployment rate.

Northeast Connector Project

Table 4.9.1-2 provides a summary of select socioeconomic and demographic information for the counties that would be affected by the Northeast Connector Project based on 2010 census and other data. York County, Pennsylvania had a population of 434,972 with a population density of 478 persons per square mile. Mercer and Middlesex Counties, New Jersey had populations of 366,511 and 809,862 with population densities of 2,622 and 1,196 persons per square mile. In all three counties, population density was significantly higher than that of the respective state.

TABLE 4.9.1-2
Existing Socioeconomic Conditions in the Vicinity of the Northeast Connector Project

State/County/ Municipality	Population [a]	Population Growth (Percent) (2000 – 2010) [a]	Population Density (persons/ sq. mile) [a]	Per Capita Income [a]	Civilian Labor Force [a]	Unemployment (Percent) [b]	Top Three Sectors [a]
Compressor Station 195							
York County	434,972	1.4	478	$28,042	233,976	6.4	EH, M, RT
Pennsylvania	12,702,379	3.4	284	$27,824	6,447,161	6.8	EH, M, RT
Compressor Stations 205 and 207							
Mercer County	366,511	4.5	1,632	$36,721	193,061	5.3	EH, PS, RT
Middlesex County	809,862	7.9	2,622	$34,153	429,102	6.0	EH, PS, RT
New Jersey	8,864,590	5.4	1,196	$35,678	4,633,565	6.7	EH, PS, RT

Sources:
[a] U.S. Census Bureau, 2013
[b] U.S. Bureau of Labor Statistics, 2014

Sector Key:
EH = Educational, health, and social assistance
M = Manufacturing
PS = Professional, scientific, management, administrative, and waste management services
RT = Retail trade

In 2010, York County had a civilian labor force of 233,976 people and a per capita income of $28,042, which was higher than the corresponding statewide average for Pennsylvania. Mercer and Middlesex Counties had labor forces of 193,061 and 429,102 people and per capita incomes of $36,721 and $34,153, respectively. Per capita income in each of these counties was similar to the New Jersey state average of $35,678. In all three counties, the predominant industry was identified as education, health, and social assistance. Other important industries included: manufacturing; professional, scientific, management, administrative, and waste management services; and retail trade.

Based on data from the U.S. Bureau of Labor Statistics, the unemployment rate in York County as of November 2013 (the most recent data available) was 6.4 percent, which was lower than the statewide average of 6.8 percent in Pennsylvania. The unemployment rates for Mercer and Middlesex

Counties as of November 2013 (the most recent data available) were 5.3 and 6.0 percent, respectively, and the statewide average for New Jersey was 6.7 percent (U.S. Bureau of Labor Statistics, 2013). [24]

Transco estimates that approximately 50 workers would be required for construction activities at Compressor Station 195, of whom about 20 workers would be local hires. This could result in a slight but temporary reduction in the unemployment rate in York County and surrounding areas. About 30 workers would be non-local hires who would move to the area for the duration of construction. This would result in a slight but temporary increase in the local population. No new hires would be required to operate Compressor Station 195 following construction of the Northeast Connector Project.

Transco expects to use 5 workers each at Compressor Stations 205 and 207, all of whom would be non-local. This would result in a temporary but negligible increase in the local populations in these areas. No new hires would be required to operate the compressor stations following construction of the Northeast Connector Project.

4.9.2 Housing

Table 4.9.2-1 reports select housing statistics for the areas that would be affected by the Projects. There are approximately 2,000 vacant units combined in QCD14 and BCD18; 1,120 vacant units in York County, Pennsylvania; 560 vacant units in Mercer County, New Jersey; and 1,200 vacant units in Middlesex County, New Jersey. The vacant units include those used for seasonal, recreational, or occasional use (U.S. Census Bureau, 2012 and 2013).

TABLE 4.9.2-1
Housing Characteristics in the Rockaway and Northeast Connector Project Areas (2010)

State/County/Municipality	Owner Occupied (Percent)	Renter Occupied (Percent)	Seasonal or Occasional Use Vacant Units	Owner Vacancy Rate (Percent)	Rental Vacancy Rate (Percent)
Rockaway Project					
QCD14	37.8	62.2	1,607	2.3	3.7
BCD18	57.8	42.2	387	1.8	2.0
Queens County	43.0	57.0	5,894	2.4	4.4
Kings County	27.7	72.3	3,872	3.2	4.2
New York State	53.3	46.7	289.301	1.9	5.5
Compressor Station 195					
York County	75.5	24.5	1,117	1.9	7.0
Pennsylvania	69.6	30.4	161,582	1.8	8.1
Compressor Stations 205 and 207					
Mercer County	65.9	34.1	558	1.6	8.5
Middlesex County	66.6	33.4	1,224	1.4	5.3
New Jersey	65.4	34.6	134,903	1.8	7.6

Source: U.S. Census Bureau, 2012 and 2013

[24] Monthly unemployment rates, not seasonally adjusted.

As previously indicated, construction of the Rockaway Project at its peak would require about 25 non-local workers, but the majority of these non-local workers are expected to sleep on the lay barge. An estimated 5 non-local workers associated with onshore activities could require temporary housing accommodations on the Rockaway Peninsula or in Brooklyn. Construction of the Northeast Connector Project would require 30 non-local workers at Compressor Station 195 and 5 non-local workers each at Compressor Stations 205 and 207. Based on vacancy rates in the community districts/counties affected by the Projects, there would be an adequate supply of rental units in each area to accommodate the non-local workers. Consequently, the Projects could have a short-term positive impact on the rental industry in each area through higher occupancy rates, though the effect would be minor due to the small number of non-local workers that would require housing. Because no new permanent hires would be required, the operational phases of the Projects would have no impacts on available housing.

4.9.3 Public Services

Construction of the Projects could result in minor, temporary impacts on local community facilities and services such as police, fire, and medical facilities. Table 4.9.3-1 summarizes the main public service facilities in the community districts/counties affected by the Projects. Construction activities may require the assistance of fire, police, or medical services in the event of an emergency, including worker illnesses or injuries. Additionally, local police may need to assist in maintaining traffic flows during construction, particularly for the Rockaway Project, which is located in a major metropolitan area. Impacts on police, fire, and medical services would be temporary, short term, and localized. Government services would be adequate to support the temporary addition of small numbers of non-local workers in each area.

TABLE 4.9.3-1
Public Service Facilities in the Rockaway and Northeast Connector Project Areas

Community District/County	Police Departments	Fire and EMS	Public Schools	Medical Facilities
Rockaway Project				
QCD14, Queens County, New York	3	3	28	Peninsula Hospital Center and St. John's Episcopal Hospital South Shore
BCD18, Kings County, New York	4	4	22	Beth Israel Medical Center, Kings Highway Division
Northeast Connector Project				
York County, Pennsylvania	25	88	111	York Hospital, Memorial Hospital York, Hanover Hospital
Mercer County, New Jersey	14	47	112	University Medical Center at Princeton; Robert Wood Johnson University Hospital; Capital Health System Mercer Campus; St. Francis Medical Center
Middlesex County, New Jersey	25	39	196	Robert Wood Johnson University Hospital; Saint Peter's University Hospital; Raritan Bay Medical Center; JFK medical Center

Sources: New York City Department of City Planning, 2012a; NYCDEP, n.d.; New York City Department of City Planning, 2012b; York County, Pennsylvania, 2013; PublicSchoolReview.com, 2013; Mercer County Prosecutor's Office, 2013; ThirdAge.Com, 2013; RadioReference.com, 2013; FireDepartmentDirectory.com, 2013;

No schools would be affected directly by construction or operation of the Projects. Additionally, given the short-term duration of construction, it is unlikely that non-local construction workers would bring their children and place incremental demands on school enrollment or other school services.

During construction, the Projects would use water and power from local municipal supply companies to support upland construction activities. The Projects would generate a small amount of solid waste, such as trash, debris, and sanitary wastes, which would be disposed of at local landfills, recycling centers, or other facilities permitted to handle the wastes. The demand for these services is not expected to exceed the capabilities of existing infrastructure.

Operation of the Projects would have little impact on existing services. Operation of the facilities would be automated and self-contained. No new local service employees would be hired as a result of the Projects. The primary demand on local services would be in the event of an emergency, such as a gas leak or fire. Transco has existing emergency response procedures in place that comply with the DOT's regulations in Title 49 CFR Part 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*. These procedures outline steps to ensure a prompt and comprehensive response in the event of a pipeline emergency (see Section 4.12). Transco would meet regularly with local emergency response officials to share emergency response plans, pipeline location information, and background information on natural gas pipeline operations. If needed, required responses from the local fire department would be for crowd control and to address perimeter fires. The role of the police department would be for crowd/traffic control.

4.9.4 Transportation

Construction activities associated with the Projects, particularly the Rockaway Project, which is located in a major metropolitan area, could result in short-term impacts on transportation infrastructure, primarily due to increased traffic flows associated with movement of construction vehicles, personnel, and equipment, and from potential damage to local roadways due to traffic by heavy construction equipment. Impacts associated with vessel traffic in the offshore construction area are discussed in Section 4.8.4.2. Transportation impacts associated with the Northeast Connector Project would be minor.

During construction of the Rockaway Project, materials and equipment would need to be delivered to and from the job sites. Construction workers would also need to commute to and from work, but they would typically travel outside of peak commuting hours (i.e., arrival before 7:00 a.m. in the morning and departure before 4:00 p.m. in the afternoon). Table 4.9.4-1 provides a summary of the estimated construction traffic, existing traffic, and traffic capacity of the major roads that would be used for the Rockaway Project. As indicated on the table, the number of daily trips associated with material and equipment deliveries and commuting construction workers is small compared with the capacity and annual average daily traffic present on the routes with access to the Rockaway Project area.

Traffic on the Rockaway Peninsula or in Brooklyn temporarily could be interrupted on roads when necessary for construction equipment and materials to cross roadways, but these temporary interruptions would likely last 5 to 10 minutes and would be managed in accordance with applicable NYSDOT and local New York City requirements. Transco would acquire permits for loads exceeding 80,000 pounds, as necessary, and would adhere to applicable New York City and New York State regulations regarding traffic, weight, and truck restrictions. Any road surfaces that are damaged would be repaired to pre-existing or better condition. As such, we do not expect construction of the Rockaway Project to have a major impact on road traffic or use.

TABLE 4.9.4-1
Land Transportation Associated with Construction of the Rockaway Project

Affected Roadway/ Access Route [a]	Number of Automobile Lanes	Peak Hourly Capacity [b,c]	Annual Average Daily Traffic [d]	Average Daily Trips (Construction Vehicles) [e]	Average Daily Trips (Project Commuter) [e]
Flatbush Avenue (landward of Rockaway Inlet)	4	1,412 (NB) 1,049 (SB)	24,262	10	110
Marine Parkway-Gil Hodges Memorial Bridge	4	1,227 (NB) 998 (SB)	24,690	6	16
Cross Bay Boulevard	4	1,518 (NB) 1,279 (SB)	30,016	6	16
Cross Bay Veterans Memorial Bridge	4	1,047 (NB) 768 (SB)	21,240	6	16
South Front Street	2	125 (NB) 122 (SB)	2,133	1	6

[a] All roads are paved with asphalt.

[b] Traffic count data obtained from 2002 and 2009 NYSDOT Coverage and Special County Hourly Report, and 2009 New Jersey Department of Transportation (NJDOT) traffic counts. NB = northbound direction, SB = southbound direction.

[c] Construction worker traffic tends to occur outside of peak traffic hours and may not affect Peak Hourly Capacity.

[d] Annual Average Daily Traffic (AADT) 2010 (for both directions) obtained from NYSDOT Traffic Data Viewer. AADT 2009 obtained from NJDOT Traffic Count Website.

[e] Average daily trips (one way) are estimated based on the most likely construction activities, which would use Flatbush Avenue, the Marine Parkway-Gil Hodges Memorial Bridge, Cross Bay Boulevard, Cross Bay Veterans Memorial Bridge, and South Front Street as the construction/commute route.

Transportation impacts associated with construction of the Northeast Connector Project would be short term and localized. The movement of construction equipment and materials to each site could have a temporary impact on traffic but, once delivered, the equipment and material would remain on each site until construction is complete. Workers would commute to and from each site during off-peak hours, and Transco expects that workers would carpool to minimize impacts on traffic. Transco would coordinate with state and local officials to obtain any required permits for use of roads and would comply with weight limitations and any other restrictions on area roadways. Transco additionally would remove any soils that fall from equipment on to roads. Therefore, we do not expect construction of the Northeast Connector Project to have a major impact on road traffic or use.

4.9.5 Property Values

The potential impact of natural gas pipelines on the value of any land parcel depends on a number of factors, including the size of the property, the presence of other pipelines in the area, the current value of the parcel and its land use, and the value of other nearby properties. The Rockaway Project would traverse lands under the jurisdiction of New York State, the TBTA, and the NPS. Land disturbance associated with pipeline construction would be temporary because Transco would restore areas disturbed from pipeline construction to their original, pre-construction condition. Any impacts the Rockaway Project may have on the value of public lands are expected to be offset by compensation provided for in easement and/or lease agreements. The Northeast Connector Project is not expected to affect property values because the proposed modifications would occur at existing compressor station sites.

4.9.6 Economy and Tax Revenues

Construction and operation of the Rockaway Project would have a beneficial impact on local tax revenue as shown in Table 4.9.6-1. Based on the projected workforce, Transco estimates that local employment compensation would be between $3.25 million and $4.87 million. A significant portion of the materials and consumables required to carry out construction activities, the value of which could total $21.7 million, would be sourced from vendors in the New York/New Jersey area. Additionally, workers would spend money on goods, services, and other consumables in the region, a portion of which would be subject to state and county sales tax. It is estimated that total direct spending in the local area could range between $2.65 million and $3.92 million during construction. According to a study conducted for Transco by the Chesapeake Group, the economic benefits of the Rockaway Project associated with indirect spending in the New York metropolitan area would range from $5.54 million to $8.23 million (The Chesapeake Group, 2012). Overall, the economic impacts due to construction of the Rockaway Project would be beneficial at the local, county, and state level, but these impacts would be limited to the duration of the construction period.

TABLE 4.9.6-1
Local Tax Revenues Generated from the Rockaway Project

Local Tax Revenues	Low Estimate	High Estimate
New York City income	$149,000	$668,000
Sales and commuter	$248,000	$461,000
Transient accommodations	$3,600	$4,000
Property (annual)	$5,315,000	$5,315,000
Total Annual Local Revenues	**$5,715,600**	**$6,448,000**

Sources:
Liu et al., 2011; The Chesapeake Group, 2012; New York City Department of Education, 2011

Operation of the Rockaway Project would provide additional tax revenues on an annual basis. It is estimated that the Rockaway Project would contribute over $5.3 million in annual property taxes (The Chesapeake Group, 2012). Over a 50-year period, the cumulative total of these property taxes would be $265 million (estimated in constant tax dollars).

The Rockaway Project is not expected to increase the demand for schools, road maintenance and repair, and public services, or to increase public utility costs for New York City. Instead, the Rockaway Project would generate annual recurring property tax revenue for New York City, which could be used to fund other municipal activities and operations. Therefore, the Rockaway Project would have a long-term positive fiscal impact on QCD14, BCD18, and New York City.

The proposed Rockaway Delivery Lateral would cross beneath Jacob Riis Park, but impacts on this area would be minimized by using the HDD construction method. Activities associated with the HDD are not expected to create a major restriction to access or use of the GNRA. It is possible that patronage of the pitch-and-putt golf course at Jacob Riis Park would decline temporarily for a short period in the spring/summer of 2014 due to construction noise. This decline may not necessarily impact the GNRA or surrounding communities if golfers are able to use other nearby facilities such as the Brooklyn Golf Center and the Marine Park Golf Course. Construction noise due to operation of the HDD equipment at the entry site would be less than 55 dBA in the vicinity of the beach and would not likely affect users of the beach. Additional information on noise impacts is provided in Section 4.11.2.

It is also possible that the number of visitors to the GNRA/Jacob Riis Park, and specifically Rockaway Beach, may be reduced during the peak season due to the visibility of the offshore construction equipment. If recreational participation does fall, a short-term, negative impact on park concession sales is likely. During the operational phase of the Rockaway Project, the pipeline would be buried underneath the pitch-and-putt golf course and would not interfere with recreational uses of the park.

As discussed in Sections 4.5 and 4.6, the nearshore waters of the New York Bight produce significant quantities of commercially and recreationally important fish and shellfish. Approximately 5.6 million pounds of finfish and 5.2 million pounds of shellfish with values of $5.5 million and $5.4 million, respectively, were commercially landed within 3.0 miles of the entire New York shore in 2010 (NOAA, 2010). Table 4.9.6-2 summarizes the top five commercial fish landings, in terms of dollars, for nearshore New York waters in 2010.

TABLE 4.9.6-2
Top Five Commercial Fish Landings (Value) up to 3.0 Miles off the New York Shoreline in 2010

Species	Pounds	Value ($)	Price per Pound ($)
Striped bass (*Morone saxatilis*)	747,000	1,927,000	2.58
Atlantic blue crab (*Callinectes sapidus*)	891,000	1,443,000	1.62
Atlantic surfclam (*Spisula solidissima*)	1,924,000	1,283,000	0.66
Loligo squid (*Loligo pealei*)	1,170,000	1,199,000	1.16
American Lobster (*Homoarus americanus*)	258,000	1,081,000	4.32

Source: NOAA, 2010

Offshore construction activities for the Rockaway Project could temporarily impact commercial and recreational fish species in the New York Bight. Most of the impact would be short term and associated with increases in turbidity and sedimentation resulting from construction activities (e.g., trenching and dredging, HDD operations, and sediment re-deposition). Transco intends to coordinate with commercial and recreational fisherman prior to construction so that no significant catch would be lost. Following construction, all recreational and commercial fishing areas would be restored with no restrictions. Therefore, the operation of the Rockaway Project would not have any permanent economic impact on the fisheries in the area.

Construction of the Northeast Connector Project would result in a beneficial but temporary impact on local sales tax revenues due to material and supply purchases and local spending by workers. For activities at Compressor Station 195 in York County, Pennsylvania, Transco estimates approximately $120,000 in local sales tax as a result of material purchases and about $1,000,000 in direct local spending by workers for hotels, food, and entertainment. No local sales tax would be generated as a result of material purchases for Compressor Stations 205 and 207 in Mercer and Middlesex Counties, New Jersey, but direct local spending by workers at each site would be approximately $3,000. Transco currently pays property taxes for each of the compressor station sites and does not expect that these taxes would change as a result of the Northeast Connector Project.

4.9.7 Environmental Justice

EO 12898 on EJ recognizes the importance of using the NEPA process to identify and address, as appropriate, any disproportionately high and adverse health or environmental effects of federal programs, policies, or activities on minority populations and low-income groups. The provisions of EO 12898 apply equally to Native American programs. Consistent with EO 12898, the CEQ has called on federal agencies to actively scrutinize the following issues with respect to EJ (CEQ, 1997a):

- the racial and economic composition of affected communities;
- health-related issues that may amplify project effects to minority or low-income individuals; and
- public participation strategies, including community or tribal participation in the NEPA process.

The EPA provides guidance on determining whether there is a minority or low-income community to be addressed in a NEPA analysis. According to this guidance, minority population issues must be addressed when minorities comprise over 50 percent of an affected area or when the minority population percentage of the affected area is substantially greater than the minority percentage in the larger area of the general population. Low-income populations are those that fall within the annual statistical poverty thresholds from the U.S. Department of Commerce, Bureau of the Census Population Reports, Series P-60 on Income and Poverty.

In accordance with these guidelines, we prepared an EJ analysis for the Rockaway Project. Table 4.9.7-1 shows the racial composition and economic status of QCD14 and BCD18 compared with Queens and Kings Counties and New York State. Each of the community districts encompasses multiple neighborhoods and census tracts. Therefore, Table 4.9.7-1 also includes information on the individual census tracts affected by the Rockaway Project (tracts 918 and 702.02). Because the Rockaway Project would be located near the western boundary of each of these tracts, the adjacent tracts to the west are also included in the table (i.e., tracts 916.02 and 666). The data presented in the table are based on the 2010 American Community Survey (U.S. Census Bureau, 2012).

In addition to federal requirements, the NYSDEC established Commissioner's Policy 29 in 2003 to provide guidance on how to incorporate EJ into permit reviews, enforcement, grants, and public participation (NYSDEC, 2012a). The Rockaway Project would not be located in any potential EJ communities as designated by the NYSDEC (2012b and 2012c). The boundary of the closest potential EJ community is located about 350 feet west of the proposed M&R facility (NYSDEC, 2012c). According to map data obtained from the NYSDEC, the eastern boundary of this potential EJ community runs along Flatbush Avenue between Avenue V and the Marine Parkway Bridge (see Figure 4.9.7-1). The potential EJ community encompasses the New York City-managed portion of Marine Park as well as the area south of Belt Parkway and west of Flatbush Avenue managed by the NPS. The potential EJ community does not include the Marine Park residential neighborhoods further to the north and west. The area associated with this potential EJ community overlaps with census tract 666. According to the 2010 census data, the population of this census tract is zero, meaning there were no permanent residents anywhere within this potential EJ community at the time of the census.

Figure 4.9.7-1
Potential Environmental Justice Communities in the Vicinity of the Rockaway Project
Rockaway Delivery Lateral
and Northeast Connector Projects

Source: NYSDEC

TABLE 4.9.7-1
Economic Statistics for Communities Affected by the Rockaway Project

State/County/ Municipality	Racial Composition of Population (Percent)								Median Household Income	Persons Below Poverty (Percent)
	White	Black or African American	Asian	American Indian and Alaska Native	Native Hawaiian and Other Pacific Islander	Persons Reporting Some Other Race	Persons Reporting Two or More Races	Persons of Hispanic or Latino Origins		
QCD14	35.8	37.9	1.0	0.1	0.0	0.4	1.4	23.5	$47,924	22.4
Census Tract 918	94.1	0.0	0.0	0.0	0.0	5.9	0.0	0.0	[a]	[a]
Census Tract 916.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	[b]	[b]
BCD18	24.9	61.7	3.7	0.2	0.0	0.7	0.7	8.2	$58,824	11.4
Census Tract 702.02	67.6	32.4	0.0	0.0	0.0	0.0	0.0	0.0	[a]	[a]
Census Tract 666	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	[b]	[b]
Queens County	27.4	17.6	23.1	0.2	0.1	1.9	2.1	27.6	53,054	15.0
Kings County	35.6	32.2	10.5	0.2	<0.1	0.3	1.3	19.9	$42,143	23.0
New York State	58.2	14.4	7.3	0.2	<0.1	0.4	1.6	17.7	$54,148	14.9

[a] No sample observations or too few sample observations available to compute a valid income estimate at the tract level.
[b] This tract had zero population in the 2010 census.
Source: U.S. Census Bureau, 2012

Activities during construction would occur in non-residential areas where no EJ communities are present. These areas do not possess minority or low income communities, and it is unlikely that minority communities would interact with Rockaway Project construction activities or operations, except through potential employment as part of the local labor force. Based on this, we do not believe the Rockaway Project would have an impact on potential EJ communities.

As described above, the Rockaway Project would have negligible to minor effects on socioeconomic characteristics and economies within the region of influence, and many of the project-related effects, while minor, would generally be viewed as positive. As discussed throughout this EIS, potentially negative environmental effects associated with the Rockaway Project would be minimized and/or mitigated, as applicable. Although the racial and economic composition of the counties affected by the proposed Rockaway Project route shows some differences from state-level statistics, there is no evidence that the Rockaway Project would cause a disproportionate share of adverse environmental or socioeconomic impacts on any racial, ethnic, or socioeconomic group.

The primary health issue related to the Rockaway Project would be the risk associated with an unanticipated pipeline failure. Section 4.12 discusses the localized risks to public safety that could result from a pipeline failure and describes how applicable safety regulations and standards would minimize the potential for these risks. The routing of the proposed Rockaway Project through non-residential areas would further minimize the number of persons who would be at risk of injury due to a pipeline failure. There is no evidence that such risks would be disproportionately borne by any racial, ethnic, or socioeconomic group.

4.10 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires the FERC to take into account the effects of its undertakings (including the issuance of Certificates) on properties that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. Transco, as a non-federal party, is assisting the FERC in meeting its obligations under Section 106 and the implementing regulations in 36 CFR 800 by preparing the necessary information, analyses, and recommendations, as authorized by 36 CFR 800.2(a)(3).

4.10.1 Cultural Resource Surveys

For the Rockaway Project, Transco conducted a marine archaeological assessment for the offshore portion of the pipeline, terrestrial archaeological assessments for the onshore portion of the pipeline and the M&R facility, and a historic structures assessment for the hangar complex at Floyd Bennett Field that would contain the M&R facility. The results of these investigations are described in the subsections below.

Transco proposes to use approximately 7.6 acres of existing public roads to access the HDD entry site for the pipeline on the Rockaway Peninsula and the M&R facility on Floyd Bennett Field. These consist of existing paved roads that would not be modified for construction. Therefore, survey of the roads was not required. No new or modified access roads are proposed for the Rockaway Project.

Transco proposes to utilize an existing industrial/commercial site along Arthur Kill in Elizabeth, New Jersey as a pipe yard during construction of the Rockaway Project. In February 2013, Transco requested concurrence from the New Jersey SHPO that survey of the pipe yard is unnecessary because no ground-disturbing activities or alteration of existing facilities would occur at the site. The New Jersey SHPO responded that no historic properties would be affected by use of the pipe yard. We concur with this assessment.

No surveys were conducted for the Northeast Connector Project. Construction activities at Compressor Stations 205 and 207 would be limited to the use of hand tools to replace/adjust equipment within the existing compressor buildings at these sites. These activities are unlikely to affect historic properties and are covered by an agreement between Transco and the New Jersey SHPO that categorically exempts modifications of existing Transco facilities (such as compressor stations) from further review for impacts on historic properties. We concur that the proposed uprates at Compressor Stations 205 and 207 would not affect historic properties.

Construction at Compressor Station 195 would require modifications to equipment within the existing compressor building as well as installation of new facilities within the existing station yard at the site. Construction activities occurring within the fence line at the compressor station are covered by an agreement between Transco and the Pennsylvania SHPO that categorically exempts modifications of existing Transco facilities from further review for impacts on historic properties. As shown in Figure 2.1.3-1, the existing fence at Compressor Station 195 surrounds the compressor building and other aboveground facilities at the site, but it does not enclose the entire station yard. Construction activities that would occur outside of the fence line would be limited to previously disturbed areas within the station yard, but they are not covered by Transco's agreement with the Pennsylvania SHPO. Therefore, Transco sent a letter to the Pennsylvania SHPO regarding the need to conduct a survey in the area outside the existing fence line at Compressor Station 195. In a May 2013 reply to Transco, the Pennsylvania SHPO stated that there are no historic properties in the area of potential effect at Compressor Station 195. We concur with this assessment.

Marine Archaeological Surveys

In 2009, a marine archaeological assessment for the offshore portion of the Rockaway Project was conducted, consisting of a geophysical survey using a magnetometer, side-scan sonar, and sub-bottom profiler (PBS&J, 2009). The study area for this survey measured 2.8 miles in length by 2,400 feet in width near the shoreline and up to 4,000 feet in width at the tie-in with the LNYBL. In total, the survey examined approximately 1,097 acres of seafloor within waters under the jurisdiction of New York State and the NPS. No evidence of potentially significant magnetic anomalies or sonar targets that might be indicative of buried cultural resources was identified. Further, no evidence of sub-bottom profile records that might indicate the presence of intact sediments or landforms with the potential to contain sites was identified. Based on these findings, Transco recommended that there would be no effect on significant cultural resources for the area covered by the survey. A report summarizing the results of the investigation was submitted to the NPS and the New York SHPO for review in September 2009. No comments on the report were received from the NPS. In November 2009, the New York SHPO concurred with the results but requested additional information on one of the sonar targets identified in the survey area. Transco provided the requested information, and no additional comments were received from the New York SHPO. We concur with the results and recommendations of the survey.

An additional marine archaeological assessment was conducted in 2010 to survey potential anchorage areas along the offshore portion of the pipeline (PBS&J, 2011). Magnetometer, side-scan sonar, and sub-bottom profiler data were gathered within an expanded study area measuring about 3.2 miles in length by up to about 1.0 mile in width. In total, the survey examined about 1,291 acres of seafloor within waters under the jurisdiction of New York State. The survey identified two magnetic anomaly clusters and associated sonar targets that were interpreted as potential cultural resource sites, possibly shipwrecks. Both locations are in an area that could be used for anchoring a pipe lay barge. The survey report for the archaeological assessment recommended that these magnetic anomaly clusters, plus a buffer area extending for a distance of 164 feet from the margins of each cluster, be avoided during anchoring. The field assessment also identified a paleochannel that may indicate the presence of intact sediments or landforms with the potential to contain significant buried cultural resource sites. The paleochannel is located 6 to 18 feet below the seafloor in an area where no trenching for the Rockaway Delivery Lateral would occur; therefore, the channel would not be affected by construction of the project. A report describing the results of the investigation was submitted to the New York SHPO for review in January 2013. The New York SHPO subsequently concurred with Transco's recommendations in March 2013. We also concur.

In May 2013, Transco filed an avoidance plan for the two magnetic anomaly clusters identified as potential cultural resource sites. Prior to construction, Transco would require its contractor to locate the clusters using navigational quality GPS and a magnetometer, and position a 3-foot diameter buoy in the vicinity of each cluster. Construction vessels, such as the lay barge and anchoring tugs, would have the location of each cluster plus the 164 foot buffer area marked on their navigation screens, and would avoid anchoring in these areas during construction. Onboard Transco representatives would monitor vessel movements to ensure that vessels, anchors, and anchoring cables do not cross the avoidance area for each cluster. To date, this plan has not been reviewed or commented on by the New York SHPO.

The route for the offshore pipeline segment crosses two inactive subsea cables that are greater than 50 years in age. One is believed to be the Cape Cod to New York telegraph cable, which was installed in 1899 for the French Cable Company. The other is believed to be the New York to Fisherman's Point (Cuba) telegraph cable, which was installed in 1907 for the Central and South American Telegraph Company. Magnetic anomalies associated with these cables were identified as a result of Transco's initial marine archaeological assessment (PBS&J, 2009). Transco subsequently prepared a historic context for each of the cables and evaluated the significance of the sites. The study

characterized the cables as typical examples of early twentieth century subsea telegraphy lines. Transco concluded that the cables are not eligible for listing in the NRHP. A report summarizing the results of Transco's study (Wuebber et al., 2013) was submitted to the New York SHPO for review in January 2013. The New York SHPO concurred with Transco's recommendations in March 2013. We also concur.

As discussed in Section 2.1.1, Transco proposes to install an anode bed extending about 1,200 feet perpendicular to the pipeline near the HDD exit pit in the Atlantic Ocean. The location of the anode bed is in the area covered by Transco's marine archaeological assessments (PBS&J 2009, 2011). No evidence of submerged cultural resources or intact sediments or landforms with the potential to contain sites was identified in the vicinity of the anode bed.

Terrestrial Archaeological Surveys

Transco completed an archaeological assessment for the proposed M&R facility in 2011 (Harris, 2011). Initially, the assessment was used to determine the need for archaeological monitoring associated with geotechnical and environmental investigations in and around the hangar complex within which the M&R facility would be constructed. Transco recommended no survey due to the low sensitivity for intact cultural resources in this area, and no monitoring during the geotechnical and environmental investigations because of the limited size of the area to be disturbed by the testing. Transco submitted a report describing the results of the archaeological assessment to the NPS and New York SHPO in November 2011. Both agencies concurred with Transco's recommendation. We also concur.

Transco subsequently proposed excavating test holes and trenches to identify utilities located around the hangar complex. The NPS requested that this activity be monitored by an archaeologist because the test holes and trenches would extend to an unknown depth and disturb a larger area than that impacted by the geotechnical and environmental testing described above. A letter summarizing the proposed excavation of the test holes and trenches and the associated monitoring was submitted to the New York SHPO for review in June 2012. The New York SHPO concurred with the proposed monitoring in July 2012. We also concur.

Excavation of the test holes and trenches was completed in May 2013. No significant cultural resources were identified as a result of the monitoring. Transco submitted a report describing the results of the investigation to the NPS in May 2013 and to the SHPO in October 2013. Both agencies concurred with the results of the monitoring and agreed that no additional monitoring in the vicinity of the hangars is warranted. We also concur.

Transco's archaeological assessment for the onshore pipeline route and associated workspace on the Rockaway Peninsula examined a study area measuring approximately 3,500 feet in length by 1,000 feet in width and encompassing about 88.0 acres (Zieseing and Harris, 2012). The study area included the HDD entry site and National Grid tie-in point within TBTA property and the proposed pipeline right-of-way for the HDD segment of the pipeline across Rockaway Beach and Jacob Riis Park. The assessment identified the Fort Tilden and Jacob Riis Park Historic Districts in the vicinity of the Rockaway Delivery Lateral on GNRA lands on the Rockaway Peninsula. Both districts are listed in the New York State Register of Historic Places (SRHP) and the NRHP. The proposed pipeline would be installed beneath the Jacob Riis Park Historic District using the HDD construction method; the pipeline would be near, but not cross, the Fort Tilden Historic District.

Transco recommended archaeological testing along the onshore pipeline route in areas assessed as having a high sensitivity for cultural resources and where ground-disturbing activities would occur within 10 feet of the surface. The near-surface impact areas that meet these criteria are at the HDD entry

site and National Grid tie-in point on the TBTA property. Transco recommended archaeological monitoring in areas assessed as having a medium sensitivity for containing cultural resource sites and where ground-disturbing activities would occur within 10 feet of the surface, but no medium sensitivity areas occur along the onshore pipeline route.

Transco's archaeological assessment of the onshore pipeline route also considered potential visual impacts on cultural resources within and near the proposed construction areas on the Rockaway Peninsula, including impacts on the Jacob Riis Park and Fort Tilden Historic Districts. The onshore portion of the pipeline, including the segment beneath Jacob Riis Park, would be installed using the HDD method. This would avoid disturbing the ground surface except at the HDD entry point (on TBTA property), which would be restored to preconstruction condition. No permanent buildings or other aboveground structures would be built by Transco on the Rockaway Peninsula. Consequently, Transco recommended that there would be no long-term visual impact on the Jacob Riis Park and Fort Tilden Historic Districts.

Transco submitted a report (Zieseing and Harris, 2012) describing the results of its archaeological assessment for the Rockaway Peninsula to the NPS and New York SHPO for review and comment. Both the NPS and New York SHPO concurred with the results of the investigation and with Transco's recommendation for additional testing of high sensitivity areas at the HDD entry site. We also concur.

Transco proposed a change in methodology for testing at the HDD entry site following a visit to the property in October 2013. The area was observed to be covered with construction grade gravel with a portion of the site disturbed by excavation of an HDD pit for construction of the Natural Grid BQI pipelines. Transco concluded that additional testing in this area would be impractical given the condition of the site.[25] Instead, Transco proposed to conduct archaeological monitoring at the site during construction of the Rockaway Delivery Lateral. In November 2013, the New York SHPO concurred with Transco's proposal to conduct archaeological monitoring at the site, but requested a work plan for this activity. Transco subsequently submitted a work plan to the New York SHPO for review. The New York SHPO concurred with the work plan in November 2013. We requested changes to the plan, and Transco has made the requested changes. Transco would file a report describing the results of the monitoring with the New York SHPO and FERC after the monitoring is complete.

Historic Structures Assessment – Hangars 1 and 2 at Floyd Bennett Field

The proposed M&R facility would be constructed within the hangar complex (Hangars 1 and 2) on Floyd Bennett Field, which is listed as a district in the NRHP and in the SRHP (Greenwood and Torres, 1978). A revised NRHP nomination form for the Floyd Bennett Field Historic District was prepared in 2010 (Kierstead, 2010). The revised form identifies the period of significance for the district as 1928 to 1945 and the areas of significance as Transportation, Military, Architecture, and Engineering. The form indicates that Floyd Bennett Field is eligible for the NRHP under Criterion A (sites associated with events that have made a significant contribution to the broad patterns of history) and Criterion C (sites that embody the distinctive characteristics of a type, period, or method of construction; that represent the work of a master; that possess high artistic values; or that represent a significant distinguishable entity whose components may lack individual distinction). The form identifies Hangars 1 and 2 as contributing elements to the significance of the Floyd Bennett Field Historic District.

Transco prepared a draft historic structures report (HSR) for Hangars 1 and 2 to serve as a planning tool for the proposed rehabilitation and conversion of the hangar complex for the M&R facility (URS, 2012). Transco would adapt the hangars, which currently are in deteriorated condition, to use them for the M&R facility. The exterior of the hangars would be restored, while the interior would be cleaned

[25] National Grid began construction at this site with concurrence from the New York SHPO.

and deteriorated and damaged areas would be repaired or replaced. Most of the existing concrete floor would be removed; underground and aboveground piping, machinery, and equipment would be installed; and the floor would be replaced with new concrete flooring or foundations, concrete pads, or crushed stone. A standby generator would be installed within a lean-to building connected to Hangar 2. The missing roof would be replaced, and ventilation systems would be installed for the meter station equipment. Missing mortar and/or cracks in exterior brick would be repaired or replaced, and areas in both the interior and exterior of the hangars would be repainted.

Other design elements identified by Transco in filings with the Commission for the proposed rehabilitation of the hangar complex are as follows:

- Transco would salvage and replace existing paving stones to the extent feasible in areas around the hangar buildings where trench excavation is necessary to install the inlet and outlet pipes that would connect the M&R facility to National Grid's pipeline along Flatbush Avenue.

- Piping and equipment installed by Transco would occupy the entire space within Hangar 1. The concrete floor in this hangar would be removed and replaced at grade with concrete foundations and pads or with crushed stone.

- Piping and equipment installed by Transco would occupy about 60 percent of the space within Hangar 2. In these areas, the existing concrete floor would be removed and replaced at grade with a new concrete floor. Another 20 percent of the existing floor would be removed and replaced in kind to correct settling of the existing floor within the building. About 10 percent of the existing floor would be cordoned off from the metering equipment and preserved in place.

- The existing tracks for the rolling hangar doors occupy about 10 percent of the floor in Hangar 2. Transco would remove and replace these tracks to make the doors operational. Additionally, Transco would refurbish the tracks on the other hangar doors in an effort to make them operational.

- About 6,115 cubic yards of spoil would be excavated (by mechanical excavation or alternative methods such as hand or vacuum excavation) from within the hangar complex to install the piping and equipment. Another 1,400 cubic feet of material would be excavated in the areas around the hangars where trenches are excavated for the inlet and outlet pipes. Spoil that is suitable for backfill would be replaced following the installation of piping and equipment. Spoil that is not suitable for backfill would be removed from the site and disposed of at an approved disposal facility in accordance with any applicable regulations.

- Transco would install steel bollards in front of the rolling hangar doors on both the north and south sides of Hangar 1 for protection against rolling vehicles. The bollards would be embedded in the tarmac at 4-foot intervals across each door (or about 37 bollards along each door). Based on the current design, Transco anticipates that every fourth bollard would be illuminated to ensure that the entire array of bollards is visible at night.

- Signs would be placed on the doors of the hangars to identify the M&R facility, prohibit smoking in the vicinity of the facility, and provide contact information for Transco. The signs would be designed by Transco in coordination with the NPS. No pipeline markers

would be installed at the facility, though National Grid would install pipeline markers outside the boundaries of Floyd Bennett Field along Flatbush Avenue.

- Ventilation of equipment installed in Hangar 1 would be accomplished by means of roof-mounted fans and an emergency flue. Ventilation of equipment installed in Hangar 2 would be accomplished by means of metal flues on the roof. The fans and metal flues on the roof would be concealed from view by the parapets surrounding the building.

We received a comment from a stakeholder asking what the public would see when looking at the M&R facility through the windows of the hangars (assuming the Rockaway Project is approved and the M&R facility is constructed). The original glass on window openings at the hangars consists of semi-transparent, single panes with embedded diamond wire and a patterned rear surface. The glass allows interior features close to the windows to be discerned by exterior viewers, but blurs interior features further inside the structures. Transco proposes to use similar glass in its rehabilitation of the hangars, which would allow for impressionistic views of the interior, but not sharp resolution. Much of the equipment installed within the hangars would be below viewing planes into the structure from window openings or would be far enough inside that they would not be clearly visible to exterior observers.

Transco submitted a draft of the HSR to the NPS in September 2012. Transco provided the NPS with revisions to the HSR in April 2013. The NPS commented on the revisions provided by Transco in May 2013, and Transco submitted comment responses to the NPS in July 2013. Transco submitted a final HSR to the NPS–Denver Service Center in September 2013, NPS staff at the GNRA in October 2013, and both the New York SHPO and the Commission in November 2013. To date, we have not received any comments on the final HSR from the NPS or New York SHPO.

Consultation with the NPS and the New York SHPO regarding the architectural design for rehabilitation of the M&R facility is ongoing. Conceptual drawings were submitted to both agencies. An initial schematic design was submitted to the NPS in June 2012; the NPS provided comments on the design in July 2012; and Transco responded to the NPS comments in October 2012. Transco filed a Schematic Design Submittal and SHPO comments on the Submittal in July 2013. The SHPO commented that the proposed rehabilitation of the hangars appears to meet the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 CFR 68). Transco filed a set of construction drawings and plans for the proposed rehabilitation of Hangars 1 and 2 in October 2013, but we have not received comments on these documents from the NPS and New York SHPO.

Transco expects to submit final design and construction documents for the M&R facility to the FERC, NPS, and New York SHPO in 2014. Transco would prepare Historic American Buildings Survey (HABS) documentation of the monitor structure (an addition within the hangar that would be removed as part of the rehabilitation of the structure) after the final HSR and the design and construction documents are accepted by the agencies and the Section 106 process is complete.

Transco conducted a study (AKRF, Inc., 2013) to assess the potential effects of construction and operational vibration on the integrity of the hangar complex. Transco's study found that vibrations resulting from individual pieces of construction equipment (such as a pile driver or jackhammer) operating at distances ranging from 5 to 10 feet from the hangars would not damage the structures, but the simultaneous operation of multiple pieces of equipment or equipment operating at distances closer than 5 to 10 feet could potentially cause damage. The study recommended that the engineering design for the M&R facility identify a vibration level threshold for the hangars, and that Transco prepare and implement a Construction Protection Plan (CPP) to protect the integrity of the hangar complex during construction. Transco additionally stated that an onsite engineer would have stop-work authority in the event that the measurement thresholds identified in the CPP are exceeded, and that corrective actions would be

implemented, as appropriate, to protect the integrity of the structures. Transco also committed to using low-impact construction equipment (e.g., auger-driven piles as opposed to hammer-driven piles), and materials that can be installed in low headroom areas.

With regard to operations, Transco's study found that vibrations resulting from the operation of equipment installed at the M&R facility would not affect the integrity of the structure provided that a minimum buffer of 1 inch is maintained between the pipelines and the hangar buildings (including support piles for the buildings) where the inlet and outlet pipes enter and exit the hangar. The pipelines would enter/exit the hangar underground and between the piles supporting the structure to maintain this buffer. Additional information on Transco's vibration study is provided in Section 4.11.

Transco filed a CPP (also referred to as a Building Protection Plan) for the hangar complex in October 2013 (GZA GeoEnvironmental, Inc., 2013). The CPP established a vibration level threshold for work in and around the hangars, and identified methods for vibration, building movement, and crack gauge monitoring during construction. To date, we have not received comments on the CPP from the NPS or New York SHPO.

Transco's proposed workspace on Floyd Bennett Field would abut Hangars 3 and 4, which are located about 140 feet to the northwest of Hangars 1 and 2. These structures, which are historic buildings identified as contributing elements to the significance of the Floyd Bennett Field Historic District, could potentially be affected by vibrations associated with the operation of construction equipment in the workspace. To ensure that Hangars 3 and 4 are protected from vibrations during construction, they are included in Transco's CPP and would be subject to vibration monitoring during construction.

Transco's application to the Commission contained information on potential atmospheric and audible impacts due to operation of the M&R facility at and around Hangars 1 and 2. Operation of equipment at the facility would result in emissions due to combustion exhaust, leaking equipment, and venting activities. Under normal operating conditions, these emissions would not be visible or result in odors in the vicinity of the site. Noise resulting from operating equipment is estimated to be 110 dB within the hangars, but noise attenuation from the walls and roof of the building would reduce the levels to 90 dB just outside the hangars. Noise levels would be further reduced with increasing distance from the hangars. Additional information on emissions and noise is provided in Section 4.11.

The ACHP's regulations at 36 CFR 800.5 require federal agencies to assess effects on properties that are listed in, or eligible for listing in, the NRHP. Our Determination of Effect for the proposed reuse and rehabilitation of Hangars 1 and 2 will include an assessment of the proposed design relative to the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 CFR 68), and in particular, the *Standards for Rehabilitation* and *The Guidelines for Rehabilitating Historic Structures*.[26] These standards are used by federal agencies to determine if modifications of a historic property to accommodate a contemporary use would maintain the historic character and materials of the property.

[26] Available online at http://www.nps.gov/hps/tps/standguide/rehab/rehab_standards.htm.

The NPS completed its review of the effects of the Rockaway Project on the hangars in February 2014. In letters to the FERC dated February 11 and 12, 2014, the NPS indicated that, after careful review of all documentation submitted to date, it determined that the adaptive reuse of Hangars 1 and 2 at Floyd Bennett Field and the installation of the Rockaway Delivery Lateral beneath Jacob Riis Park would have no adverse effect on the qualities that qualified Floyd Bennett Field Historic District and/or Jacob Riis Park Historic District for listing on the NRHP provided the following mitigation measures are incorporated:

- When a large portion of the utility runs around Hangars 1 and 2 are excavated, a NPS archaeologist must be notified and be present to afford NPS the opportunity to record a larger profile of the fill materials. This documentation will provide baseline data for future projects in the vicinity of the hangars.

- In the unlikely event that unanticipated archaeological resources are identified during construction, GATE Cultural Resources will be notified immediately.

- The character of the cultural landscape would be better preserved if hangar lighting (inside and outside) is kept to levels that do not exceed existing facilities along hangar row. Any lighting (interior, exterior, or bollards) should be minimal.

- The 95 percent Construction Documents, dated December 30, 2013, have been submitted for review and are the basis for the NPS determination. Some details of the Rockaway Project remain to be resolved to the satisfaction of NPS, but will be resolved prior to the start of construction. These include, but are not limited to:

    - finish on the copper fascia;

    - new stair details;

    - installation of floor drains for a future, replacement concrete floor slab where removed by Transco; and

    - final review of the project specifications.

- NPS will be afforded the opportunity to review specific samples and finishes for all character-defining features including but not limited to:

    - new face brick;
    - pointing;
    - exterior lighting;
    - mockup of a restored hangar door;
    - mockup of a restored window (wood and metal);
    - new window, fabricated to match the existing (wood and metal); and
    - new kalamine door, fabricated to match the existing.

The NPS concluded by stating that, while the final resolution of the details and samples outlined above have not been accepted, the resolution of these outstanding items would not change its overall assessment of effect on the historic district.

Our Determination of Effect will be completed after the final HSR, the final design and construction documents, and the CPP are reviewed and approved by the FERC, NPS, and New York

SHPO. If the Commission approves the Projects, and we are unable to make a Determination of Effect at that time, the Commission would negotiate a Programmatic Agreement with the ACHP in accordance with the regulations at 36 CFR 1800.14(b)(1)(ii).

We received numerous comments from stakeholders regarding Transco's proposed use of Hangars 1 and 2 for the M&R facility. One stakeholder commented that use of the hangars would be appropriate noting that another hangar complex at Floyd Bennett Field previously was adapted for use as the Aviation Sports and Events Center. This stakeholder additionally noted that Hangars 1 and 2 currently are in disrepair but would be stabilized as a result of Transco's proposed rehabilitation. Most stakeholders commented that use of the hangars as an M&R facility would be inappropriate for a historic property regardless of the rehabilitation of the structures. These stakeholders also observed that installation of the M&R facility in the hangers would prevent any future public use of the interior space within the buildings. These and any other comments we receive would be considered by the FERC in the Determination of Effect for the Rockaway Project. As discussed in Section 4.8.7, the NPS has determined that the M&R facility would be an appropriate use for the hangars.

Copies of the final HSR, construction drawings and plans, and CPP were made available for public review at the Ryan Visitor Center at Floyd Bennett Field during the comment period for the draft EIS. One individual signed in at the visitor center to review these documents but did not leave any comments.

4.10.2 Unanticipated Discovery Plan

Transco prepared an Unanticipated Discovery Plan for the Rockaway Project to provide guidelines in the event that cultural resources or human remains are discovered during the course of construction. The FERC provided a copy of this plan to the NPS for review. Transco additionally prepared Unanticipated Discovery Plans for the Northeast Connector Project for construction activities in New Jersey (Compressor Stations 205 and 207) and Pennsylvania (Compressor Station 195). We find the plans to be acceptable.

4.10.3 Native American Consultation

On December 8, 2011, Transco sent introduction letters for the Rockaway Project to one federally recognized tribe, the Shinnecock Indian Nation; one New York state-recognized tribe, the Unkechaug Indian Nation; and one New Jersey state-recognized tribe, the Nanticoke Lenni Lanape Indians. On February 12, 2013, the Commission sent letters to four federally recognized tribes, the Shinnecock Indian Nation, Stockbridge-Munsee Community, Delaware Tribe of Indians, and Delaware Nation, requesting comments on the Rockaway Project. On February 13, 2013, Transco sent letters to three federally recognized tribes, the Stockbridge-Munsee Community, Delaware Tribe of Indians, and Delaware Nation, requesting comments on the Rockaway Project. In a reply letter to the FERC dated March 4, 2013, the Delaware Nation expressed an interest in the Rockaway Project and requested copies of the cultural resources survey reports prepared by Transco. On March 8, 2013, Transco sent copies of the reports to the Delaware Nation. To date, no other responses have been received regarding the Rockaway Project.

The Commission sent copies of its *Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Northeast Connector Project and Request for Comments on Environmental Issues* and *Notice of Availability of the Draft Environmental Impact Statement for the Proposed Rockaway Delivery Lateral and Northeast Connector Projects and Notice of Comment Meetings* to the Shinnecock Indian Nation, Stockbridge-Munsee Community, Delaware Tribe of Indians, and Delaware Nation. No responses have been received to date.

4.10.4 General Impact and Mitigation

Construction and operation of the Projects could potentially affect historic properties. Direct effects could include destruction or damage to all or a portion of an archaeological site or alteration or removal of a historic property. Indirect effects could include the introduction of visual, atmospheric, or audible elements that affect the setting or character of a historic property.

Compliance with Section 106 of the NHPA has not been completed for the Projects. Transco completed onshore and marine archaeological assessments for the Rockaway Project, but consultation is ongoing. Additionally, the final design and construction documents for reuse and rehabilitation of Hangars 1 and 2 are pending.

If the FERC, in consultation with the NPS and New York SHPO, determines that a historic property would be adversely affected by the Rockaway Project and could not be avoided, Transco would be required to prepare a treatment plan in consultation with the appropriate parties to mitigate adverse effects. The FERC would afford the ACHP an opportunity to comment in accordance with 36 CFR 800.6. Implementation of a treatment plan would occur after certification of the Projects and receipt from the FERC of written notification to proceed.

If all necessary plans and studies have not been filed and consultation has not been completed before any authorization issued by the Commission, the FERC would negotiate a Programmatic Agreement with the ACHP in accordance with the regulations at 36 CFR 800.14(b)(1)(ii).

The FERC and Pennsylvania SHPO have concurred that no historic properties would be affected by the Northeast Connector Project at Compressor Station 195. Therefore, no further consultation for this project is required.

To ensure that the FERC's responsibilities under the NHPA and its implementing regulations are met, **we recommend that:**

- **Transco should not begin implementation of any treatment plans/measures (including archaeological data recovery); construction of facilities; or use of staging, storage, or temporary work areas, and new or to-be-improved access roads for the Rockaway Project <u>until</u>:**

  a. Transco files all outstanding survey and evaluation reports, the final design and construction drawings for Hangars 1 and 2, any necessary treatment plans, and written comments from the NPS and the New York SHPO on all reports and plans for the Rockaway Project;

  b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected or a Programmatic Agreement has been executed; and

  c. the FERC staff reviews and the Director of OEP approves all cultural resource reports and plans, and notifies Transco in writing that the treatment plans/mitigation measures may be implemented and/or that construction may proceed.

  All material filed with the Commission that contains location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE."

4.11 AIR QUALITY AND NOISE

4.11.1 Air Quality

Air quality would be affected by construction and operation of the Projects. Although air emissions would be generated by construction activities, the majority of new emissions would result from operation of four natural gas-fired heating units and an emergency generator that would be installed within the proposed M&R facility as part of the Rockaway Project. While no new compressor facilities would be required, modifications/upgrades would be made at Compressor Stations 195, 205, and 207 for the Northeast Connector Project. At Compressor Station 195, Transco proposes to replace three existing gas-fired reciprocating engines with two new electric motor drives, which would result in a decrease in operating emissions at this site. The modifications at Compressor Stations 205 and 207 would involve the use of hand tools to replace/adjust equipment within the existing compressor buildings at these sites. These activities would not result in construction emissions or an increase in operating emissions at Compressor Stations 205 and 207.

4.11.1.1 Existing Air Quality

Climate

The Rockaway Project area has a climate that is characterized as humid continental, with warm summers, cool winters, and high humidity year round. Average monthly temperatures range from a low of 27 °F in January to a high of 84 °F in July. Precipitation is relatively evenly distributed throughout the year with an average monthly low of 3.21 inches in February and an average monthly high of 4.60 inches in July. Snow accumulations in a typical year range from 25 to 35 inches (New York State Climate Office, 2013; Weather.com, 2013).

Compressor Station 195 is located in York County, Pennsylvania, which has a humid continental climate characterized by warm to hot summers and cold to very cold winters. Average monthly temperatures in the vicinity of the compressor station range from a low of 22 °F in January to a high of 90 °F in July. Average monthly precipitation ranges from a low of 2.95 inches in February to a high of 4.29 inches in July. Snowfall averages about 25 inches per year (NOAA, 2013; Weather.com, 2013; CurrentResults.com).

National Ambient Air Quality Standards

The CAA requires the EPA to set National Ambient Air Quality Standards (NAAQS). The NAAQS represent maximum levels of background pollutants that are considered safe with an adequate margin of safety to protect public health (primary standards) and welfare (secondary standards). The EPA has set standards for six criteria pollutants. Table 4.11.1-1 lists the federal NAAQS for these pollutants.

TABLE 4.11.1-1
National Ambient Air Quality Standards

Criteria Pollutant	Primary/ Secondary	Averaging Time	Level	Form
SO_2	Primary	1-hour	75 ppb [a]	Ninety-ninth percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year
CO	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Pb	Primary and secondary	Rolling 3-month average	0.15 $\mu g/m^3$ [b]	Not to be exceeded
NO_2	Primary	1-hour	100 ppb	Ninety-eighth percentile, averaged over 3 years
	Primary and secondary	Annual	53 ppb [c]	Annual mean
Ozone	Primary and secondary	8-hour	0.075 ppm [d]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution				
$PM_{2.5}$	Primary	Annual	12 $\mu g/m^3$	Annual mean, averaged over 3 years
	Secondary	Annual	15 $\mu g/m^3$	Annual mean, averaged over 3 years
	Primary and secondary	24-hour	35 $\mu g/m^3$	Ninety-eighth percentile, averaged over 3 years
PM_{10}	Primary and secondary	24-hour	150 $\mu g/m^3$	Not to be exceeded more than once per year on average over 3 years

Source: EPA, 2012

Notes:

SO_2 = sulfur dioxide
CO = carbon monoxide
Pb = lead
NO_2 = nitrogen dioxide
$PM_{2.5}$ = particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10} = particulate matter less than 10 microns in aerodynamic diameter
ppm = parts per million
ppb = parts per billion
$\mu g/m^3$ = micrograms per cubic meter

[a] Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking, but these standards remain in effect until 1 year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

[b] Final rule signed October 15, 2008. The 1978 Pb standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[c] The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

[d] Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, the EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

The EPA and local agencies established Air Quality Control Regions (AQCRs) as a means to implement the CAA and comply with the NAAQS through State Implementation Plans (SIPs). The AQCRs are intra- and interstate regions, such as large metropolitan areas, where improvement of the air quality in one portion of the region typically requires emissions reductions throughout the AQCR. Each AQCR, or portion thereof, is designated as attainment, nonattainment, maintenance, or unclassifiable. Areas where the ambient air pollutant concentration is below the applicable Ambient Air Quality Standards (AAQS) are designated as attainment. Areas where the ambient air concentration is greater than the applicable AAQS are designated as nonattainment. Areas that have been designated nonattainment for a pollutant but have since demonstrated compliance with the AAQS are designated as maintenance for that pollutant. Areas where no data are available are designated as unclassifiable.

The Rockaway Project area is located in the New Jersey-New York-Connecticut (NJ-NY-CT) Interstate AQCR 43, also known as the New York-Northern New Jersey-Long Island, NY-NJ-CT area. The New York State portion of this area currently is designated as moderate nonattainment for the 1997 8-hour ozone standard, as marginal nonattainment for the 2008 8-hour ozone standard, and as nonattainment for the 1997 and 2006 standards for particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$). Compressor Station 195, which is located in York County, Pennsylvania, is designated as nonattainment for the 1997 and 2006 standards for $PM_{2.5}$.

State Ambient Air Quality Standards

New York

The EPA allows states to adopt their own AAQS, but such standards cannot be less stringent than the NAAQS. The NYSDEC has adopted AAQS that differ in some respects from the NAAQS. Table 4.11.1-2 identifies the AAQS adopted by New York State. There are no state-level ambient air quality standards for Pennsylvania.

Background Ambient Air Quality

Air quality monitoring data from the EPA's Air Quality System was reviewed to characterize background air quality for regulated criteria pollutants in the vicinity of the Projects. Air quality data from the NYSDEC also was reviewed for the Rockaway Project. Air quality monitoring stations closest to the proposed M&R facility at Floyd Bennett Field were used as representative background values for the entire Rockaway Project area. Air quality monitoring stations closest to Compressor Station 195 were used as representative background values for this area. The highest monitored values for each pollutant from the stations were selected. The background ambient air quality values for the Rockaway Project and Compressor Station 195 are listed in Tables 4.11.1-3 and 4.11.1-4, respectively.

TABLE 4.11.1-2
New York Ambient Air Quality Standards

Air Pollutant	Averaging Period	New York Ambient Air Quality Standards [a]
SO_2	1-hour [b]	Federal
	3-hour [b]	Federal
	24-hour [c]	Federal
	Annual	30 ppm
CO	1-hour	35 ppm
	8-hour	9 ppm
Pb	Rolling 3-month	See note [d]
NO_2	Annual	50 ppb
	1-hour [e]	Federal
Ozone	8-hour [f]	None
	1-hour	0.12 ppm [g]
Particle Pollution		
$PM_{2.5}$	24-hour	None
	Annual	None
PM_{10}	24-hour	Federal [h]
Total Suspended Particulates (TSP) [i]	24-hour	250 µg/m³
	12 consecutive months	75 µg/m³
Hydrocarbons	3-hour (6 to 9 a.m.)	0.24 ppm

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[a] New York State also has ambient standards for beryllium, fluorides, hydrogen sulfide, and settleable particles (dustfall). Ambient monitoring for these pollutants is not currently conducted.

[b] One-hour standard is the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor not to exceed 75 ppb (0.075 ppm). The 3-hour standard is a maximum not to exceed 500 ppb more than once per calendar year. Annual SO_2 is not to exceed value.

[c] The EPA is revoking the 24-hour and annual primary SO_2 standard but is retaining the secondary standards. As of August 13, 2012, the EPA still includes primary SO_2 standards for the 24-hour period, so they are retained here. The NYSDEC maintains an annual SO_2 standard.

[d] The federal standard for Pb has not yet been officially adopted by New York State. Based upon the November 22, 2011 EPA designation, which became effective on December 31, 2011, the 0.15 µg/m³ standard replaced the previous level of 1.5 µg/m³ throughout New York State as of January 1, 2013. The 1978 Pb standard (1.5 µg/m³ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard (i.e., December 31, 2012 in New York State).

[e] To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb (0.1 ppm), effective January 22, 2010.

[f] Average of 4th highest daily maximum over 3 years.

[g] The EPA revoked the 1-hour ozone standard in all areas, although some areas have continuing obligations under that standard ("anti-backsliding"). The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

[h] The federal standard for PM_{10} has not yet been officially adopted by New York, but it is currently being applied to determine compliance status.

[i] There are no monitoring sites for TSP in the New York City metropolitan area, but New York TSP standards are still in effect. New York State also has 30-, 60-, and 90-day standards, as well as geometric mean standards of 45, 55, and 65 µg/m³ in Part 257 of the NYCRR.

TABLE 4.11.1-3
Background Ambient Air Quality for the Rockaway Project

Air Pollutant	Averaging Period	Monitor Values [a]	Monitoring Site
SO_2	1-hour	28 ppb (3-year average, 99th percentile)	Eisenhower Park, East Meadow, Nassau County, NY
	3-hour	36.5 (second highest)	Eisenhower Park, East Meadow, Nassau County, NY
	24-hour	12 ppb	Eisenhower Park, East Meadow, Nassau County, NY
	Annual	1.97	Eisenhower Park, East Meadow, Nassau County, NY
CO	1-hour	2.1	Queens College, New York, Queens, NY
	8-hour	1.8	Queens College, New York, Queens, NY
Pb	Rolling 3-month	See note b	See note b
NO_2	Annual	21.6	Queens College, New York, Queens, NY
	1-hour	67	Queens College, New York, Queens, NY
Ozone	8-hour	0.075	Queens College, New York, Queens, NY
	1-hour	0.128	Queens College, New York, Queens, NY
Particle Pollution			
$PM_{2.5}$	24-hour	23	Hempstead, Lawrence High School, Nassau County, NY
	Annual	8.9	Hempstead, Lawrence High School, Nassau County, NY
PM_{10}	24-hour	47	Queens College, New York, Queens, NY
Total Suspended Particulates (TSP) [c]	24-hour	None	None
	12 consecutive months	None	None
Hydrocarbons	3-hour (6 to 9 a.m.)	See note d	–

Source: For NAAQS – EPA, 2011a: http://www.epa.gov/air/criteria.html. For monitor values – EPA, 2011b; NYSDEC, 2012a.

[a] Monitored values of pollutants obtained from the Air Data Section of EPA or NYSDEC ambient monitoring report for 2011.

[b] The 3-month average statistic currently is not available from the EPA Air Quality System Data Mart. The federal standard for Pb is not yet officially adopted by New York State. Based upon the November 22, 2011 EPA designation for areas of New York State, which became effective on December 31, 2011, the 0.15 µg/m³ standard became effective throughout New York State on January 1, 2013 and will replace the previous level of 1.5 µg/m³. The 1978 Pb standard (1.5 µg/m³ as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard (December 31, 2012 throughout New York State).

[c] There are no monitoring sites for TSP in the New York City metropolitan area; but New York TSP standards are still in effect. New York State also has 30-, 60-, and 90-day standards, as well as geometric mean standards of 45, 55, and 65 µg/m³ in Part 257 of NYCRR.

[d] New York monitors for toxics (VOCs) on an every sixth day midnight-to-midnight schedule. No monitoring is performed specifically for the New York State hydrocarbon standard.

TABLE 4.11.1-4
Background Ambient Air Quality for the Northeast Connector Project

County/Air Pollutant	Averaging Period	Maximum Monitor Value	Actual Exceedances	Monitoring Site EPA ID
York				
SO_2	1-hour	41 ppb	0	421330008
	3-hour	N/A	N/A	N/A
	24-hour	9 ppb	0	421330008
	Annual	N/A	N/A	N/A
CO	1-hour	3 ppm	0	421330008
	8-hour	1.3 ppm	0	421330008
Pb	Rolling 3-month	N/A	N/A	N/A
NO_2	Annual	N/A	N/A	N/A
	1-hour	63 ppb	0	421330008
Ozone	8-hour	0.088 ppm	5	421330008
	1-hour	0.092	0	421330008
$PM_{2.5}$	24-hour	32.3 µg/m³	0	421330008
	Annual	N/A	N/A	N/A
PM_{10}	24-hour	49 µg/m³	0	421330008

N/A = This information was not available through the EPA
Source: http://www.epa.gov/airdata/ad_rep_mon.html

4.11.1.2 Air Quality Regulatory Requirements

Federal Regulations

Clean Air Act

The CAA of 1970, 42 USC 7401 et seq., as amended in 1977 and 1990, is the primary federal statute governing air pollution. As noted above, the EPA had designated six pollutants as criteria pollutants under the CAA for which NAAQS have been developed to protect public health and welfare. The six criteria pollutants are:

- particulate matter (also known as particle pollution), which includes particulate matter less than 10 microns in aerodynamic diameter (PM_{10}) and $PM_{2.5}$;
- carbon monoxide (CO);
- SO_2;
- nitrogen dioxide (NO_2);
- Pb; and
- ground-level ozone (Table 4.11.1-1).

VOCs are not considered criteria pollutants, but they are analyzed as pollutants because they are precursors to ground-level ozone formation.

Prevention of Significant Deterioration and Nonattainment New Source Review

Air quality is regulated under the EPA's Prevention of Significant Deterioration (PSD) program for areas in attainment and the Nonattainment New Source Review (NNSR) program for areas in nonattainment. The PSD regulations apply to new major stationary sources or major modifications to stationary sources located in attainment areas. The NNSR regulations apply to new or modified stationary sources located in nonattainment areas.

According to the PSD applicability criteria for industrial sources that are not one of 28 source categories listed in Title 40 CFR 52.21(b)(1)(i)(a), a PSD review would be triggered if the source would have a potential-to-emit (PTE) more than 250 tons per year (tpy) of any New Source Review (NSR) pollutant or for any proposed physical change that would occur at a minor stationary source where the change would constitute a major stationary source in itself. The Projects would not be subject to PSD because they are located in areas designated as nonattainment.

The M&R facility and associated pipeline would be located within a designated nonattainment area for the 8-hour ozone standard. NO_x and VOCs are precursor pollutants to ozone. The major NNSR thresholds for NO_x and VOCs in areas designated as nonattainment for ozone are 25 tpy. Table 4.11.1-5 lists the calculated operational emissions of the M&R facility. As indicated on the table, the operational emissions from this facility would not exceed the thresholds for NO_x and VOCs and, therefore, would not trigger NNSR.

TABLE 4.11.1-5
Calculated Potential Operational Emissions for the M&R Facility (Annual)

Equipment	NO_x (tpy)	CO (tpy)	VOCs (tpy)	$PM/PM_{10}/PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (metric tpy)
Total for four pipeline heating units [a]	8.5	14.3	0.9	1.3	0.1	20,406
Emergency generator	1.1	2.2	0.6	0.02	<0.01	253
Total	**9.6**	**16.5**	**1.5**	**1.3**	**0.1**	**20,659**
Major source permit threshold		100		100	100	100,000

[a] For emission estimation purposes, it is assumed each heating unit would operate for 8,760 hours per year (full-year operation) using natural gas as fuel. The emergency use generator is limited to 500 hours per year operation.

Compressor Station 195 is located in an area designated as nonattainment for $PM_{2.5}$. As discussed in more detail below, the proposed modifications at Compressor Station 195 would result in a decrease in operational emissions, including a decrease of 2.0 tpy for $PM_{2.5}$. Because NNSR applies to major modifications of sources that would result in an increase of emissions, the proposed modifications at Compressor Station 195 would not be subject to NNSR.

New Source Performance Standard Subpart JJJJ

New Source Performance Standards (NSPS) for various engine sizes and types have been promulgated by the EPA. These standards implement Section 111(b) of the CAA. The NSPS for stationary spark ignition internal combustion engines were promulgated under 40 CFR 60, Subpart JJJJ. This subpart requires that engines comply with certain emissions standards for NO_X, CO, and VOCs, and standards for performance testing and recordkeeping. The proposed natural gas-fired emergency generator engine to be installed at the M&R facility would be subject to Subpart JJJJ as it would be manufactured after the applicability date of the standards. The electric driven motors that Transco proposes to install at Compressor Station 195 would not be subject to NSPS Subpart JJJJ.

National Emission Standards for Hazardous Air Pollutants Subpart ZZZZ

National Emission Standards for Hazardous Air Pollutants (NESHAP) for reciprocating internal combustion engine (RICE) amendments are promulgated under 40 CFR 63, Subpart ZZZZ. The original major source NESHAP for RICE was amended to include those with a site rating of 500 hp or less located at major sources, and new and reconstructed stationary RICE located at area sources. An area source is defined as a minor source. The spark ignition natural gas internal combustion engine proposed for the M&R facility (i.e., the emergency generator engine) is subject to Subpart ZZZZ and a permit would be required from NYCDEP. The air quality permit issued for this facility would incorporate the applicable requirements from Subpart ZZZZ as conditions to the permit. The electric driven motors that Transco proposes to install at Compressor Station 195 would not be subject to NESHAP Subpart ZZZZ.

Federal Class I Areas

Federal Class I areas are locations afforded more stringent air quality protection for certain select values such as visibility. Two factors determine potential effects on a Federal Class I area: the magnitude of emissions and the distance from the source to the Class I area. Federal Class I areas in the northeast region of the United States include the Brigantine National Wildlife Refuge (NWR) in New Jersey, the Otter Creek and Dolly Sods Forest Service Wilderness Areas in West Virginia, and Lye Brook Forest Service Wilderness Area in Vermont. The closest of these to the Project areas is the Brigantine NWR in southern coastal New Jersey, which is located about 75 miles (120 kilometers) to the south (generally upwind) of the Rockaway Project area and about 102 miles (163 kilometers) east of Compressor Station 195.

Transco conducted a preliminary analysis of the potential impacts of operational emissions from the Projects on the Brigantine NWR using a methodology developed by the DOI for sources like the proposed heaters that would be installed and operated at the M&R facility. The methodology consists of summing annual emissions of NO_X, SO_2, PM_{10}, and sulfuric acid (H_2SO_4) mist (based on the 24-hour maximum emission rate) and dividing the total by the distance in kilometers to the Class I area. If the quotient is less than 10, then no further analysis is required.

For the Rockaway Project, the sum of the estimated emissions of NO_X, SO_2, PM_{10}, and H_2SO_4 mist from operation of the proposed M&R facility is approximately 16 tpy. This results in a quotient of 0.13 when the sum of the emissions is divided by the distance (102 kilometers) of the M&R facility to the Brigantine NWR. For the Northeast Connector Project, the sum of the estimated emissions of NO_X, SO_2, PM_{10}, and H_2SO_4 mist from operation of Compressor Station 195 is approximately 7.4 tpy. This results in a quotient of 0.04 when the sum of the emissions is divided by the distance (163 kilometers) of the compressor station to the Brigantine NWR. In each case, the value of the quotient is less than 10; therefore, no further analysis for the Projects is required.

General Conformity

Section 176 of the 1990 CAA amendments required the EPA to promulgate rules to ensure that federal actions conform to the appropriate SIP. These rules, known together as the General Conformity Rule, require any federal agency responsible for an action in a nonattainment or maintenance area for any criteria pollutant to determine if the action conforms to the applicable SIP or is exempt from the General Conformity Rule requirements. This means federally supported or funded activities cannot:

- cause or contribute to any new air quality standard violation;
- increase the frequency or severity of any existing standard violation; or
- delay the timely attainment of any standard, interim emission reduction, or other milestone.

The General Conformity Rule is codified in Title 40 CFR 93, Subpart B. A conformity determination must be conducted by the lead federal agency if a federal action's construction and operations activities are estimated to:

1. result in generating direct and indirect emissions that would exceed the conformity threshold levels (*de minimis*) of the pollutant(s) for which an air basin is in nonattainment or maintenance; or

2. result in generating direct and indirect emissions that would exceed 10 percent of the total emissions budget for the entire nonattainment or maintenance area.

The emission *de minimis* applicability thresholds listed in Table 4.11.1-6 are used to determine if there is a need to conduct a General Conformity determination for a federal action based on the current nonattainment status of any criteria pollutants in the affected region. If emissions of nonattainment pollutants are below the *de minimis* thresholds, then a General Conformity determination is not required.

TABLE 4.11.1-6
General Conformity *De Minimus* Thresholds

Ozone (Precursors)		$PM_{2.5}$ (Direct Emissions and Precursors)		
NO_X (tpy)	VOCs (tpy)	$PM_{2.5}$ Direct Emissions (tpy)	SO_2 (tpy)	NO_X (tpy)
100	50	100	100	100

Source: 40 CFR 93.153

The Rockaway Project would generate emissions during construction and operations. Construction emissions would result from the use of diesel- and gas-powered equipment and from fugitive dust. Operational emissions would result from the use of four natural gas-fired pipeline heaters and one (approximately 900-hp) natural gas-fired reciprocating engine connected to an emergency use electrical generator. For the purposes of General Conformity, National Grid's BQI Project emissions were not included as they are not subject to the jurisdiction of the FERC. See Section 1.4 and Appendix B for details on National Grid's non-jurisdictional project.

Operational emissions in New York that are subject to a SIP-approved permit program are exempt from inclusion in a General Conformity applicability analysis. The NYSDEC permit program is a SIP-approved program; thus, a determination has already been made that the permitting program, when applied to stationary sources such as the M&R facility, will not contribute to a violation of the NAAQS or delay the attainment or maintenance of the standards. Therefore, operational emissions have not been included in our General Conformity determination.

The location of the Rockaway Project is within designated nonattainment areas for $PM_{2.5}$ and 8-hour ozone. As a result, the direct and indirect emissions of $PM_{2.5}$, emissions of $PM_{2.5}$ precursor compounds (NO_x, and SO_2), and emissions of ozone precursor compounds (VOCs and NO_x) due to construction must be compared to General Conformity *de minimis* thresholds. Estimates of the reasonably foreseeable emissions from direct and indirect sources associated with construction of the Rockaway Project are listed in Table 4.11.1-7. The calculated construction emissions are considered *de minimis* because they are below the General Conformity thresholds of 50 tpy for VOCs and 100 tpy for all other criteria pollutants. Therefore, no further analysis of the Rockaway Project is required for General Conformity.

TABLE 4.11.1-7
Calculated Total Construction Emissions for the Rockaway Project

Activity/Location	NO_X (tpy)	CO (tpy)	VOCs (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)
Hangar restoration	0.19	0.41	0.03	0.02	0.02	0.01
Onshore HDD	4.82	1.42	0.38	0.26	0.26	0.13
Onshore pipeline	0.22	0.10	0.02	0.02	0.02	0.01
M&R facilities	1.59	0.81	0.16	0.17	0.16	0.08
Concrete coating (New Jersey) [a]	0.21	0.07	0.01	0.02	0.02	0.01
Land transportation	0.28	1.48	0.18	0.01	0.01	0.00
Marine operations – vessels	56.20	34.68	3.59	5.06	4.91	10.06
Marine operations – other equipment	21.12	4.63	1.11	0.84	0.82	0.49
Suction dredge	4.03	0.97	0.16	0.18	0.18	0.47
Total	**88.7**	**44.6**	**5.6**	**6.6**	**6.4**	**11.3**

[a] The emissions for concrete coating do not include the production of the concrete. As currently planned, the concrete would be delivered by a vendor facility that is assumed to have its own air permits for operating a concrete production facility.

The Northeast Connector Project would generate emissions during construction and operations activities at Compressor Station 195. Construction emissions would result from the use of diesel- and gas-powered equipment and from fugitive dust. The operational emissions would result from the continuing use of existing gas-fired engines at the site, including two reciprocating engines, an auxiliary engine, and an air compressor engine, and fugitive emissions from valves and flanges associated with gas supply lines.

Operational emissions in Pennsylvania that are subject to a SIP-approved permit program are exempt from inclusion in a General Conformity applicability analysis. The Pennsylvania Department of Environmental Protection permit program is a SIP-approved program; thus, a determination has already been made that the permitting program, when applied to stationary sources such as Compressor Station 195, will not contribute to a violation of the NAAQS or delay the attainment or maintenance of the standards. Therefore, operational emissions have not been included in our General Conformity determination for the Northeast Connector Project.

Compressor Station 195 is within a designated nonattainment area for $PM_{2.5}$. As a result, the direct and indirect emissions of $PM_{2.5}$ and emissions of $PM_{2.5}$ precursor compounds (NO_x and SO_2) must be compared to General Conformity *de minimis* thresholds. The thresholds for NO_x and SO_2 under General Conformity are 100 tpy each. As shown in Table 4.11.1-8, construction emissions calculations for Compressor Station 195 are 6.8 tpy of NO_x and 0.1 tpy of SO_2, both of which are considered *de minimis*. Therefore, no further analysis of the Northeast Connector Project is required for General Conformity.

TABLE 4.11.1-8
Calculated Total Construction Emissions for Compressor Station 195

Emission Source	NO_X (tpy)	CO (tpy)	VOCs (tpy)	$PM_{2.5}$ and PM_{10} (tpy)	SO_2 (tpy)	CO_2e (tpy)
Non-road	3.8	8.6	0.7	0.4	0.1	734
On-road	3.0	10.6	1.4	0.05	0.0	825
Total	**6.8**	**19.2**	**2.1**	**0.5**	**0.1**	**1,559**

We received a comment from the EPA regarding the scope of the General Conformity applicability analysis for the Projects. Specifically, the EPA requested confirmation that the analysis included an assessment of equipment, marine engines, emissions factors, and running times used to estimate construction emissions, and they asked that this information be included as an appendix in the final EIS. Transco's applicability analysis for General Conformity included an assessment of each of the factors identified by the EPA. A copy of Transco's original applicability analysis, as well as additional information provided in supplemental filings and in responses to staff data requests, is provided in Appendix Q.

Greenhouse Gas Mandatory Reporting Rule and Tailoring Rule

The EPA promulgated rules requiring monitoring, reporting, and record keeping for GHGs beginning in 2010. A facility would report GHG emissions to the EPA if its aggregate maximum rated heat input from all combustion sources is more than 30 million metric British thermal units per hour (MMBtu/hr), and the facility emits more than 25,000 metric tpy of carbon dioxide equivalent (CO_2e), as further described in Section 4.11.1.4.

The EPA also promulgated the PSD and Title V Greenhouse Gas Tailoring Rule. New sources and existing sources not previously subject to Title V that emit at least 100,000 tpy CO_2e are now subject to PSD and Title V requirements. In addition, sources that have the potential to emit at least 100,000 tpy CO_2e and that undertake a modification that increases net emissions of GHGs by 75,000 tpy CO_2e are subject to PSD requirements.

As shown on Table 4.11.1-9, operations at the proposed M&R facility and at Compressor Station 195 would separately result in GHG emissions that are less than 25,000 tpy CO_2e. Each facility would emit less than the thresholds listed in the Mandatory Reporting Rule and Tailoring Rule. Therefore, neither the M&R facility nor Compressor Station 195 would be subject to either rule.

TABLE 4.11.1-9
Annual Greenhouse Gas Emissions Summaries
for the Rockaway and Northeast Connector Projects

Equipment	CO_2e (metric tpy)
Rockaway Project	
Total for four pipeline heating units [a]	20,406
Emergency generator	253
Total	**20,659**
Northeast Connector Project	
Compressor Station 195 (all sources)	7,744

[a] For emission estimation purposes, it is assumed each heating unit would operate for 8,760 hours per year (full-year operation) using natural gas as fuel. The emergency use generator is limited to 500 hours per year operation.

State Regulations

Air quality in New York State and New York City is regulated by the NYSDEC and NYCDEP, respectively. Regulations for both jurisdictions require that parties planning to construct or modify equipment or use a process with the potential to emit air contaminants determine the applicability of air permitting requirements and, if necessary, submit a permit application to the agencies. The emissions units at the proposed M&R facility would have a heat input rating less than the NYSDEC permit requirement threshold of 10 MMBtu/hr, and thus would be exempt from NYSDEC permitting requirements. The emergency generator would be exempt from permitting because its operation would be limited to less than 500 hours per year. Transco would need to obtain a "Fossil Fuels Combustion Equipment Application for Permit to Construct and Certificate to Operate" permit from the NYCDEP.

Air quality in Pennsylvania is regulated by the Pennsylvania Department of Environmental Protection Bureau of Air Quality. Transco currently has all of the required air quality permits from this agency to operate Compressor Station 195. Because no new emission sources would be installed at the site, no new permits would be needed.

4.11.1.3 Air Emission Impacts and Mitigation

Construction Emissions

The use of onshore diesel- and gas-powered equipment to fabricate and install the Rockaway Delivery Lateral and construct the M&R facility would result in temporary increases in emissions of some pollutants. Construction activities would result in the temporary generation of fugitive dust due to land clearing and ground excavations. The operation of cranes, cement trucks, and barges at the pipe yard associated with coating the pipe and loading it onto barges for transport to offshore locations would also produce emissions. Additional indirect emissions would be generated by delivery vehicles and construction workers commuting to and from work areas.

Offshore construction activities would consist of pipeline installation, the hot-tap into the existing LNYBL, and the HDD operation. The pipeline would be transported by barge from the pipe yard to the offshore work zone. Thus, the primary sources of emissions during offshore construction activities would come from the marine construction vessels used to transport and install the pipeline and hot-tap and complete the HDD. Ships of various sizes, ranging from small day-use workboats to large supply vessels, pipeline construction vessels, and ocean-going tug boats, would be used.

An estimate of the combined onshore and offshore construction emissions for the Rockaway Project is provided above in Table 4.11.1-7. These emissions would occur over the duration of construction activity and would be emitted at different times and locations along the length of the Rockaway Delivery Lateral, along the route from the pipe yard to the offshore construction area, and at the M&R facility site. Emissions produced from construction equipment would be temporary and should not result in a significant impact on regional air quality.

Onshore construction fugitive dust emissions levels would vary in relation to moisture content, composition, and volume of soils during construction. Dust would be generated primarily during construction activities such as trenching and grading. Fugitive dust emissions associated with construction would be temporary and would cease when construction is completed. Transco has prepared a Dust Control Plan for construction of the Rockaway Project and would implement dust-control measures as necessary. Therefore, fugitive dust emissions are not expected to contribute to degradation of NAAQS.

Construction at Compressor Station 195 would involve the use of heavy equipment to remove three existing internal combustion engines, install two new electric motors, and construct/install associated supporting infrastructure (e.g., foundations, the electric substation, variable frequency drive building, electric cables, and access road). Use of this equipment would produce combustion emissions. Fugitive dust emissions are expected to be minor because construction would be conducted within the existing compressor station boundary requiring minimal travel on unpaved surfaces. Roads leading to Compressor Station 195 and existing roads within the station are paved and/or graveled. Equipment would remain within the station boundary during construction.

Emissions estimates for construction activities at Compressor Station 195 are shown in Table 4.11.1-8 above. Non-road emissions are based on emission factors from a run of the EPA's Non-road Emission Model (Version 2008a) for York County, Pennsylvania for the construction year 2015. Emissions factors were combined with an estimate of construction equipment activity to produce the

emissions estimate. On-road emissions from worker commute vehicles and delivery trucks were estimated using the EPA's average emissions rates as published in various fact sheets combined with estimates of vehicle miles travelled for construction activities at Compressor Station 195. Emissions produced from construction equipment would be temporary and should not result in a significant impact on regional air quality.

Operational Emissions

The operational emissions from the Rockaway Project at the M&R facility would consist of combustion exhaust from the four natural gas-fired pipeline heating units and the natural gas-fired reciprocating engine attached to the emergency use electrical generator. Natural gas would be burned using low NO_x burners, with the heat from the combustion transferring to a heat transfer fluid sent to the pipeline gas heating unit. The heating unit transfers the heat to the pipeline using natural gas to raise its temperature to meet delivery specifications. Each of the heating units would have a burner tip rating less than 10 MMBtu/hr. Table 4.11.1-5 lists the estimated annual operational emissions of criteria pollutants from the M&R facility. GHG emissions from the M&R facility are listed in Table 4.11.1-9.

Non-combustion-related emissions would result from operation of the M&R facility. Some fugitive emissions of methane (CH_4) would occur as a result of leaking equipment and natural gas venting activities. Transco would include measures in the facility's design to minimize fugitive emissions. For example, the valves and other pipeline equipment control devices that are operated using natural gas would be vented into the piping connected to National Grid's natural gas distribution system instead of vented to the atmosphere. Transco would monitor valves and flanges for leaks with gas-detection monitors and make repairs if any leak is detected. No other consequential emissions would occur during the operation of the M&R facility.

Current operating emissions from Compressor Station 195 result from combustion exhaust associated with five gas-fired reciprocating engines and gas-fired engines associated with an auxiliary engine and an air compressor. VOCs and GHGs from fugitive sources at Compressor Station 195 also occur from valves and flanges in vapor and condensate service, compressor seals in vapor service, and venting/blowdowns. Estimates of current (2012) operating emissions at the site are provided in Table 4.11.1-10.

Table 4.11.1-10
Actual Operational Emissions from Compressor Station 195 from Calendar Year 2012

Unit ID	NO_X (tpy)	CO (tpy)	VOCs (tpy)	PM_{10} and $PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)
M/L 1,2,3	60.1	27.2	4.8	2.0	0.02	4,577
M/L 4,5	18.9	18.9	11.8	2.1	0.03	4,887
AUX 1	0.3	0.34	0.04	0.01	<0.01	72.9
Air Compressor	0.01	0.02	<0.01	<0.01	<0.01	1.0
BLR 1	0.2	0.17	0.01	0.02	0.00	1,292
Fugitives	-	-	2.6	-	-	1,491
Total	**79.5**	**46.7**	**19.2**	**4.1**	**0.05**	**12,321**

Notes:
M/L 1,2,3,4 and 5 are natural gas-fired reciprocating engines

Transco proposes to replace three of the gas-fired reciprocating engines at Compressor Station 195 with electric motors, which would result in a decrease in operational emissions at the site. There would also be a slight reduction in fugitive emissions due to the removal of a small number of valves and flanges associated with gas supply lines, but this reduction would be minor. Table 4.11.1-11 lists the

calculated annual operational emissions of criteria pollutants and GHG emissions from Compressor Station 195 as a result of the Northeast Connector Project. Table 4.11.1-12 compares operational emissions from Compressor Station 195 before and after implementation of the Northeast Connector Project.

Table 4.11.1-11
Calculated Annual Operational Emissions for Compressor Station 195

Unit ID	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} and $PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)
New Electric Units [a]	0.00	0.00	0.00	0.00	0.00	0.00
M/L 4,5	18.9	18.9	11.8	2.1	0.03	4,887
AUX 1	0.3	0.34	0.04	0.01	<0.01	72.9
Air Compressor	0.01	0.02	<0.01	<0.01	<0.01	1.0
BLR 1	0.2	0.17	0.01	0.02	0.00	1,292
Fugitives	-	-	2.6	-	-	1,491
Total	19.4	19.5	14.4	2.1	0.03	7,744

[a] These would replace the existing M/L 1, 2, and 3 units.

Table 4.11.1-12
Calculated Reduction in Annual Operating Emissions at Compressor Station 195

Emissions	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} and $PM_{2.5}$ (tpy)	SO_2 (tpy)	CO_2e (tpy)
Existing Emissions (2013)	79.5	46.7	19.2	4.1	0.05	12,321
Estimated Emissions	19.4	19.5	14.4	2.1	0.03	7,744
Net Change	-60.1	-27.2	-4.8	-2.0	-0.02	-4,577

Emissions produced as a result of operations and maintenance of the Projects are unlikely to contribute to or cause a violation of any AAQS; therefore, maintenance and operations activities associated with the proposed Projects should not result in a significant impact on regional air quality. The emissions reductions estimated at Compressor Station 195 could result in an incremental improvement to air quality in the vicinity of the station and within its regional airshed. Additionally, as stated in Section 4.11.1.2, operational emissions are governed by SIP-approved programs both in New York and Pennsylvania; thus, a determination has already been made that the permitting program, when applied to stationary sources, would not contribute to a violation of the NAAQS or delay the attainment or maintenance of the standards.

4.11.1.4 Greenhouse Gas Emissions

GHGs occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. These gases are the integral components of the atmosphere's greenhouse effect that warms the earth's surface and moderates day/night temperature variation. The most abundant GHGs are water vapor, carbon dioxide (CO_2), CH_4, nitrous oxide (N_2O), and ozone. The primary GHGs produced by fossil fuel combustion are CO_2, CH_4, and N_2O. During construction and operation of the Projects, these GHGs would be emitted from non-electrical construction equipment and operating equipment such as line heaters and generators. Emissions of GHGs are typically expressed in terms of CO_2e, where the potential of each gas to increase heating in the atmosphere is expressed as a multiple of

the heating potential of CO_2, or its global warming potential (GWP). CO_2 has a GWP of 1, CH_4 has a GWP of approximately 25, and N_2O has a GWP of approximately 298 (EPA, 2014).[27]

On October 30, 2009, the EPA published the final Mandatory Reporting of Greenhouse Gases rule, establishing the Greenhouse Gas Reporting Program (GHGRP) codified in Title 40 CFR 98. Since 2011, the GHGRP has required large direct emitters of GHGs and certain suppliers (e.g., of fossil fuels, petroleum products, industrial gases, and CO_2) to report GHG information annually. Subpart W of Title 40 CFR 98 applies to petroleum and natural gas systems, including: onshore and offshore petroleum and natural gas production; onshore natural gas processing; natural gas transmission compression; underground natural gas storage; and LNG storage, import, and export facilities that emit greater than or equal to 25,000 metric tonnes[28] of GHG, as CO_2e, per year. In addition, 40 CFR 98, Subpart C applies to stationary combustion sources that emit greater than or equal to 25,000 metric tonnes of GHG as CO_2e per year. According to the EPA's GHGRP webpage, "EPA's Greenhouse Gas Reporting Program will help us better understand where greenhouse gas emissions are coming from and will improve our ability to make informed policy, business and regulatory decisions" (EPA, 2014).

Emissions of GHG pollutants associated with the construction and operation of the Projects, including all direct and indirect emission sources, were calculated and converted to total CO_2e emissions based on the GWP of each pollutant. The estimated GHG emissions from construction of the Rockaway Project, and operation of the M&R facility on a potential (8,760 hours per year) basis, are approximately 8,571 and 20,659 metric tpy, respectively. The GHGRP does not apply to construction emissions, but we have included the construction emissions for accounting and disclosure purposes. The combustion-related GHG emissions from operation of the M&R facility would be less than 25,000 metric tpy. If all actual GHG emissions from the proposed M&R facility are equal to or greater than 25,000 metric tpy, Transco would be required to comply with all applicable requirements of 40 CFR 98. As combustion sources are not planned for the proposed Rockaway Project, Subpart C would not apply. Additionally, Subpart C would not apply to the Northeast Connector Project as GHG emission estimates for Compressor Station 195 are lower than the threshold of 25,000 metric tpy of CO_2e.

Although the GHG emissions for the Rockaway Project may appear large, they actually are very small (0.00338 percent during construction, and 0.00815 percent during operations) in comparison to the New York State 2008 GHG Inventory of approximately 254 million metric tons of CO_2e (New York State Climate Action Council, 2010). Similarly, GHG emissions from operations at Compressor Station 195 for the Northeast Connector Project would represent just 0.000027 percent of Pennsylvania's 2000 GHG Inventory of 284 million metric tonnes of CO_2e (Pennsylvania Department of Environmental Protection, 2009).

We received a comment regarding combustion of the incremental supply of natural gas that would be provided by the Projects and its potential impact on GHGs and regional air quality. While the incremental supply would be used in New York City (primarily Brooklyn), the impact of combustion on GHGs and regional air quality is unknown at this time. We note that a small portion (about 15 percent by volume) of the natural gas to be provided by the Projects to National Grid is incremental (i.e., additional). The majority (about 85 percent by volume) is replacement gas, which currently is provided to National Grid via the existing delivery point in Long Beach. It is expected that at least a portion of the incremental supply would be used to convert existing heating systems in New York City from oil to natural gas, which

[27] On November 29, 2013, the EPA revised GWPs for GHGs to reflect more accurate GWPs from the Intergovernmental Panel for Climate Change Fourth Assessment Report to better characterize the climate impacts of individual GHGs and to ensure continued consistency with other U.S. climate programs, including the Inventory U.S. Greenhouse Gas Emissions and Sinks. More information is available in Volume 78 of the Federal Register, Issue 230.

[28] A metric tonne is 2,205 pounds, or approximately 1.1 tons.

is consistent with city initiatives to encourage conversions from highly polluting fuels (New York City, 2011). This could reduce GHG emissions in New York City and result in a positive impact on regional air quality, but there is insufficient data available at this time to quantify the impact of conversions from fuel oil to natural gas in heating systems in New York City. National Grid (2011) estimates that displacement of fuel oil in heating systems due to the additional gas supply provided by the Projects to the BQI Project could reduce daily GHG emissions by 11,357 metric tons of CO_2e.

4.11.1.5 Radon Exposure

Radon is a naturally occurring radioactive gas that is odorless and tasteless. It is formed from the radioactive decay of uranium (Agency for Toxic Substances and Disease Registry, 2011). Radon can be entrained in fossil fuels including natural gas. Since radon is not destroyed by combustion, burning natural gas containing radon can increase the level of radon within a home (Agency for Toxic Substances and Disease Registry, 2010). While radon is inert, its decay products (progeny) can be hazardous under conditions of long-term (chronic) exposure.

We received several comments on the draft EIS concerning the risk of radon exposure associated with burning natural gas and the concentration of radon in gas originating from the Marcellus shale. In particular, we received comments that natural gas from the Marcellus shale region contains radon at much higher concentrations than gas produced in the Gulf Coast region.

In a recent paper, Resnikoff (2012) reported that radon concentrations in natural gas from the Marcellus shale range between 36.9 and 2,576 picocuries per liter (pCi/L). However, a subsequent study by Rowan and Kraemer (2012) for the USGS suggested that Resnikoff (2012) relied on theoretical calculations utilizing limited data to estimate radon concentrations in gas from the Marcellus shale. Rowan and Kraemer (2012) found that concentrations of radon in natural gas samples from the Marcellus shale and overlapping Devonian sandstones, as measured at the wellhead, ranged from 1 to 79 pCi/L and 7 to 65 pCi/L, respectively, with median concentrations of 32 and 42 pCi/L.

The results of Rowan and Kraemer (2012) are supported by an assessment prepared by Anspaugh (2012). This assessment was based on gas samples collected from pipelines from the Marcellus shale gas fields at the point where the pipelines enter New York. Anspaugh (2012) found that radon concentrations in natural gas at the New York entry points ranged from 16.9 to 44.1 pCi/L and averaged 28.46 pCi/L. We are not aware of any studies which corroborate the findings of Resnikoff (2012) regarding the level of radon in natural gas from the Marcellus shale region.

As discussed in Section 1.3, a majority of the natural gas to be provided by the Projects (about 85 percent by volume) is replacement gas, which currently is provided to National Grid via the existing delivery point in Long Beach, New York. Only 15 percent of the natural gas provided by the Projects is incremental (i.e., additional) supply. As currently configured, the existing Transco system receives natural gas from the Gulf Coast, Appalachian, and mid-continent regions, including the Marcellus shale. Natural gas entering Transco' system from the Marcellus region is mixed with natural gas from other areas, which dilutes the concentration of radon in the gas stream.

Several factors limit the indoor exposure to radon from natural gas. Radon's half-life, defined as the time it takes for the element to decay to half its initial concentration, is relatively short (3.8 days). The time needed to gather, process, store, and deliver natural gas allows a portion of the entrained radon to decay, which decreases the amount of radon in the gas before it is used in a residence. Additionally, radon concentrations are reduced when a natural gas stream undergoes upstream processing to remove liquefied petroleum gas (LPG). This is because radon and the two major components of LPG, propane and ethane, have similar boiling points. Processing can remove an estimated 30 to 75 percent of the radon

from natural gas (Johnson et al., 1973). Other research suggests that the cumulative decay of radon from wellhead to burner tip is around 60 percent (Gogolak, 1980).

Gogolak (1980) concluded that indoor radon concentrations resulting from the use of natural gas in the home are unlikely to pose a radiological hazard to domestic users. Johnson et al. (1973) reached a similar conclusion. While the total impact to human health due to increased indoor radon concentrations could potentially be higher now than in 1973 (i.e., the time of Johnson et al.'s study) due to growth in the U.S. population and changes in dose and risk calculation methods, there is no reason to believe that the conclusions of Johnson et al. (1973) and Gogolak (1980) regarding the risks of radon in natural gas would be any different. In fact, radon exposure associated with the combustion of natural gas may be lower now due to the improved ventilation and increased energy efficiency of modern boilers, furnaces, and hot water heaters, as well as new building codes requiring venting of gas-fired stoves and ovens.

Other more recent studies also support the conclusions of Johnson et al. (1973) and Gogolak (1980). A study by Van Netten et al. (1998) found that the radon exposure risk to domestic users in U.S. and British Columbia households was virtually nonexistent. A study by Dixon (2001) in the United Kingdom reached a similar conclusion and found that individual exposure to radon associated with domestic gas use is small. Anspaugh (2012) calculated the incremental concentration of radon in residences in New York City due to combustion of natural gas from pipelines from the Marcellus shale region. The resulting value, 0.0042 pCi/L, is less than the "normal" radon level (1.86 pCi/L) in residences in New York and New Jersey (EPA Region 2). Anspaugh (2012) concluded that the radon levels in natural gas are low and will cause no significant health risk.

While the FERC has no regulatory authority to set, monitor, or respond to indoor radon levels, many local, state, and federal entities (e.g., the EPA) establish and enforce radon exposure standards for indoor air. It is expected that the combustion of gas transported by the Projects would comply with all applicable air emission standards. In the unlikely event that these standards are exceeded, the necessary modifications would be implemented to ensure public safety.

4.11.2 Noise

Sound is a sequence of waves of pressure that propagate through compressible media such as air or water. When sound becomes excessive, annoying, or unwanted, it is referred to as noise. Decibels (dB) are the units of measurement used to quantify the intensity of noise. To account for the human ear's sensitivity to low-level noises, dB values are corrected to weighted values on the A-weighted scale (i.e., dBA). Table 4.11.2-1 identifies the dBA noise levels of common sounds relative to the noise made by a garbage disposal, food blender, or pneumatic drill (which measure about 80 dBA).

Two measurements that relate the time-varying quality of environmental noise to its known effect on human receptors are the 24-hour equivalent sound level ($L_{eq[24]}$) and the day-night sound level (L_{dn}). The $L_{eq(24)}$ is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the $L_{eq(24)}$ with 10 dBA added to nighttime sound levels.

Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Late night and early morning (10:00 pm to 7:00 am) noise exposures are penalized +10 decibels to account for people's greater sensitivity to sound during the nighttime hours.

4.11.2.1 Existing Noise Levels

Existing Noise Levels in the Rockaway Project Area

The proposed Rockaway Project is located in an area characterized by a variety of land uses, including residential areas, a public beach, a pitch-and-putt golf course, a commercial airport, and some industrial facilities. Transco identified five NSAs near the M&R facility site (see Figure 4.11.2-1). These included two residences, the Floyd Bennett Gateway Park Community Garden, and two campsites within the Ecology Village of the GNRA. A description of the location of each of these NSAs relative to the M&R facility site is included in Table 4.11.2-2.

TABLE 4.11.2-1
Sound Pressure Levels and Relative Loudness

Noise Source or Activity	Sound Level (dBA)	Subjective Impression[a]	Relative Loudness (perception of different sound levels)
Jet aircraft takeoff from carrier (50 feet)	140	Threshold of pain	64 times as loud
50-hp siren (100 feet)	130		32 times as loud
Loud rock concert near stage/ Jet takeoff (200 feet)	120	Uncomfortably loud	16 times as loud
Float plane takeoff (100 feet)	110		8 times as loud
Jet takeoff (2,000 feet)	100	Very loud	4 times as loud
Heavy truck or motorcycle (25 feet)	90		2 times as loud
Garbage disposal/ Food blender (2 feet)/ Pneumatic drill (50 feet)	80	Loud	Reference loudness
Vacuum cleaner (10 feet)	70	Moderate	1/2 as loud
Passenger car at 65 mph (25 feet)	65		
Large store air-conditioning unit (20 feet)	60		1/4 as loud
Light auto traffic (100 feet)	50	Quiet	1/8 as loud
Quiet rural residential area with no activity	45		
Bedroom or quiet living room/ Bird calls	40	Faint	1/16 as loud
Typical wilderness area	35		
Quiet library, soft whisper (15 feet)	30	Very quiet	1/32 as loud
Wilderness with no wind or animal activity	25	Extremely quiet	
High quality recording studio	20		1/64 as loud
Acoustic test chamber	10	Just audible	
	0	Threshold of hearing	

Sources: Barnes and Laymon, 1977; EPA, 1971

[a] Noise sources or activities with no information in the subjective impression column have been included to demonstrate the doubling effect between 10 dBA intervals.

TABLE 4.11.2-2 NSAs Near the M&R Facility for the Rockaway Project		
NSA No.	**Location Descriptions**	**Distance and Direction from M&R Facility**
1	Multi-family residential building off Aviation Road; NSA no. 1 is considered the closest residence to the M&R facility	Approximately 2,800 feet southeast
2	Single-family residences off Aviation Road	Approximately 3,900 feet east-southeast
3	Near the entrance to the Floyd Bennett Gateway Park Community Garden; this is considered the closest NSA in the GNRA; this area typically is visited during daytime hours	Approximately 450 feet northeast
Closest garden plot	Closest plot at the Floyd Bennett Gateway Park Community Garden	Approximately 260 feet northeast
4	Area of the Ecology Village Campsite in the GNRA	Approximately 1,900 feet east
5	Area of the Ecology Village Campsite in the GNRA	Approximately 2,000 feet east

Transco conducted sound measurements in the daytime on June 14, 2012 to determine the ambient A-weighted equivalent sound levels (i.e., L_{eq}) and unweighted octave-band SPLs at three of the five NSAs as well as near the Aviation Sports and Events Center, which is northwest of the M&R facility site. The sound measurements attempted to exclude "extraneous sound" such as a vehicle passing immediately by the sound measurement position. Table 4.11.2-3 summarizes the measured ambient daytime equivalent sound level (L_d) and the calculated ambient L_{dn} at each measured site. The L_d ranged from 42.0 to 45.6 dBA and the L_{dn} ranged from 48.4 to 52.0 dBA.

TABLE 4.11.2-3 Summary of Ambient Day and Night Sound Levels at NSAs Near the M&R Facility for the Rockaway Project		
Description of Sound Measurement Location	**Measured Daytime Sound Level (dBA)**	**Calculated Day-Night Average Sound Levels (dBA)**
NSA no. 1: Residential building (i.e., multi-family residences) located 2,800 feet southeast of the M&R facility	42.3	48.7
NSA no. 2: Single-family residences located 3,900 feet east-southeast of the M&R facility	42.5	48.9
NSA no. 3: Near the entrance to the Floyd Bennett Gateway Park Community Garden, which is approximately 450 feet northeast of the M&R facility	42.0	48.4
Closest plot at the Floyd Bennett Gateway Park Community Garden, which is about 260 feet northwest of the M&R facility [a]	42.0	48.4
Near the Aviation Sports and Events Center at the GNRA, approximately 1,900 feet northwest of the M&R facility	45.6	52.0

[a] Ambient noise at this location was assumed to be similar to NSA no. 3, which is nearby.

Existing Noise Levels in the Northeast Connector Project Areas

Compressor Station 195 is located near Bryansville in York County, Pennsylvania. Land surrounding the site is primarily rural with nearby agricultural fields, forested tracts, and a few residences. Transco recorded sound measurements in the daytime on February 21, 2013 to determine the L_{eq} and unweighted octave-band SPLs at the three closest NSAs (all residences) to the site. The measured ambient L_d and the calculated ambient L_{dn} for each of these NSAs are provided in Table 4.11.2-4. The L_d ranged from 42.0 to 50.5 dBA and the L_{dn} ranged from 48.4 to 56.9 dBA for the NSAs.

TABLE 4.11.2-4
Summary of Ambient Day and Night Sound Levels at NSAs
Near Compressor Station 195 for the Northeast Connector Project

Description of Sound Measurement Location	Measured Daytime Sound Level (dBA)	Calculated Day-Night Average Sound Levels (dBA)
NSA no. 1: Residence located 500 feet east-northeast of the compressor building	50.5	56.9
NSA no. 2: Residence located 900 feet west of the compressor building	47.8	54.2
NSA no. 3: Residence located 1,400 feet south-southwest of the compressor building	42.0	48.4

Compressor Station 205 is located east of Pennington and west of Princeton in Mercer County, New Jersey. The site is situated in a rural area consisting of forested tracts, agricultural fields, and scattered residences. Transco used data from surveys conducted on August 16, 2011 augmented by data from a survey conducted in 2002 to determine the L_{eq} and unweighted octave-band SPLs at the two closest NSAs (both residences) to the site. Table 4.11.2-5 identifies the measured ambient L_d and the calculated ambient L_{dn} for each of these NSAs. The L_d ranged from 44.0 to 44.2 dBA and the L_{dn} ranged from 50.4 to 50.6 dBA for the NSAs.

TABLE 4.11.2-5
Summary of Ambient Day and Night Sound Levels at NSAs
Near Compressor Station 205 for the Northeast Connector Project

Description of Sound Measurement Location	Measured Daytime Sound Level (dBA)	Calculated Day-Night Average Sound Levels (dBA)
NSA no. 1: Residence located 1,300 feet east of Compressor Building A	44.2	50.6
NSA no. 2: Residence located 1,600 feet north of Compressor Building A	44.0	50.4

Compressor Station 207 is located south of Madison Park in Middlesex County, New Jersey. Much of the land surrounding the site is developed, with industrial facilities located to the north, west, and south of the site. Areas to the east are forested. Residential areas in the vicinity of Compressor Station 207 are found to the west-northwest, northwest, and east-southeast. Transco determined the L_{eq} and unweighted octave-band SPLs at the three closest NSAs (all residential areas) to Compressor Station 207 using data from a survey conducted on February 1, 2010. The measured ambient L_{dn} for each of the NSAs are provided in Table 4.11.2-6.

TABLE 4.11.2-6
Summary of Ambient Day and Night Sound Levels at NSAs
Near Compressor Station 207 for the Northeast Connector Project

Description of Sound Measurement Location	Measured Day-Night Sound Level (dBA) [a]
NSA no. 1: Residential area located 1,700 feet west-northwest of the compressor building	35.5
NSA no. 2: Residential area located 1,850 feet northwest of the compressor building	34.7
NSA no. 3: Residential area located 1,900 feet east-southeast of the compressor building	36.0

[a] Current sound level contribution due to Compressor Station 207

4.11.2.2 Noise Regulatory Requirements

U.S. Environmental Protection Agency

In 1974, the EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA determined that noise levels should not exceed 55 dBA L_{dn}, which is the level that protects the public from indoor and outdoor activity interference (EPA, 1974). We have adopted this criterion and use it to evaluate the potential noise impact from the operation of facilities.

Federal Energy Regulatory Commission

Pursuant to 18 CFR 157.206(d)(5), the FERC requires that the noise attributable to any new facility, compressor engine, or modifications during full load operation not exceed an L_{dn} of 55 dBA at any NSA located within one-half mile of the site. In addition, the FERC may impose requirements for temporary site construction activities, and the FERC generally uses the sound level of 55 dBA (L_{dn}) as a "benchmark criterion" for assessing the noise generated by construction activities.

U.S. Department of Housing and Urban Development Environmental Criteria and Standards

The U.S. Department of Housing and Urban Development (HUD) has adopted environmental standards, criteria, and guidelines for determining the acceptability of federally assisted projects and has proposed mitigation measures to ensure that activities assisted by the HUD will achieve the goal of a suitable living environment (HUD, 1991). These guideline values are strictly advisory. The standards, outlined in 24 CFR 51, establish a site acceptability standard based on an L_{dn} not exceeding 65 dBA.

Local Regulations

The local noise regulations relative to the areas in which the Projects would be constructed and operated are listed in Table 4.11.2-7. There are no state or local noise ordinances that are applicable to Compressor Station 195.

TABLE 4.11.2-7
Noise Guidelines, Standards, and Ordinances Applicable to the Rockaway and Northeast Connector Projects

Agency	Citation	Title	Description
New York City	Local Law 113 of the City of New York	New York City Noise Control Code	Calls for the adoption of standards and procedures to reduce noise levels from construction. Establishes sound level standards for specific equipment. Mandates the adoption of a "noise mitigation plan" by the contractor.
New York City	Title 15 of the Rules of the City of New York	Chapter 28, Citywide Construction Noise Mitigation	Prescribes the methods, procedures, and technology to be used at construction sites to achieve noise mitigation.
MOEC	CEQR Manual 2012, Chapter 16, Noise	CEQR Technical Manual	Assists city agencies, project sponsors, and the public in conducting environmental reviews subject to CEQR.
State of New Jersey	New Jersey Noise Control Act (Chapters 29, 29B)	New Jersey Noise Control Act	Sets limits for allowable noise levels for the State of New Jersey.
Lawrence Township (New Jersey)	Ordinance No. 1047-86, as amended by Ordinance No. 1060-87	Noise Control Ordinance of the Lawrence Township	Sets limits for allowable noise levels within Lawrence Township.
Borough of Sayreville (New Jersey)	Chapter V, Section 5.3: Noise, in the Sayreville Supp. No. 1, dated Feb. '03	Police Regulations for the Borough of Sayreville	Sets limits for allowable noise levels within the Borough of Sayreville
Township of Old Bridge (New Jersey)	Section 4.a ("Performance Standards", pp. 7-35 to 7-37)	The Land Development Ordinance for the Township of Old Bridge	Sets limits for allowable noise levels within Old Bridge Township.

New York City Construction Noise Rules

Local Law 113 of the City of New York calls for the adoption of standards and procedures to reduce noise levels from construction and establishes sound level standards for specific equipment. The law mandates adoption of a "noise mitigation plan" by the construction contractor.

Title 15 of the Rules of New York City, Chapter 28 (Citywide Construction Noise Mitigation) establishes standard procedures to reduce noise levels from construction and standards for specific noise sources. The following is a partial listing of the requirements for construction that are included in Chapter 28:

- a construction noise mitigation plan must be posted at the construction work site;
- the operator must self-certify in its noise mitigation plan that all construction tools and equipment have been maintained so they operate at normal manufacturer's operating specifications;
- all equipment that is operated must be equipped with the appropriate manufacturer's noise-reduction devices including but not limited to a manufacturer's muffler; and
- portable compressors, generators, and pumps must be covered with noise insulating fabric to the maximum extent possible.

In addition, New York City's rules limit the use of onshore equipment to the hours of 7:00 a.m. to 6:00 p.m. on weekdays unless an after-hours work authorization is obtained, in which case the equipment must be used in accordance with the hours specified in the permit and in the after-hours work authorization.

City of New York Environmental Quality Review

According to the CEQR Manual, if a substantial stationary source noise generator is within approximately 1,500 feet of a receptor, and there is a direct line of sight between the receptor and the generator, further analysis may be needed. If the noise from a stationary source at any receptor site would exceed 45 dBA, then a detailed analysis would be necessary. For impact evaluation, an increase of 3 dBA of the 1-hour equivalent sound level ($L_{eq[1]}$) above the existing background noise level during nighttime hours typically would be considered significant (CEQR Manual, 2012).

State of New Jersey Noise Regulations

Provisions of the New Jersey Noise Control Act (Chapters 29, 29B) are used to regulate noise in the State of New Jersey. The regulations state that the continuous airborne sound at the receiving residential property line must not exceed a sound level of 65 dBA during the daytime (7:00 a.m. to 10:00 p.m.) and a sound level of 50 dBA during the nighttime (10:00 p.m. to 7:00 a.m.). Additionally, there are unweighted octave-band SPLs that should not be exceeded.

Lawrence Township Noise Ordinance

The Noise Control Ordinance of Lawrence Township (Ordinance No. 1047-86, as amended by Ordinance No. 1060-87), where Compressor Station 205 is located, states that the maximum permissible sound level at a residential property line (i.e., the sound emanating from a commercial property to a residential property) must not exceed a sound level of 65 dBA during the daytime and a sound level of 50 dBA during the nighttime. In the case of Compressor Station 205, the Noise Control Ordinance is superseded by an agreement reached in 1990 between Transco and Lawrence Township, at which time Transco received Amended Preliminary and Final Site Plan approvals with variances and waivers from the township. Condition no. 1 in Lawrence Township Planning Board Resolution 51-90 states that "the applicant is agreeable to a condition that they cannot exceed 55 dBA (daytime) and 50 dBA (nighttime)" as measured at the residential property line.

Borough of Sayreville

Police Regulations for the Borough of Sayreville (Chapter V, Section 5.3: Noise, in the Sayreville Supp. No. 1, dated February 2003), which apply to Compressor Station 207, require that noise does not exceed a nighttime A-weighted sound level of 50 dBA (outdoors) at any residential property, and does not exceed the maximum permissible unweighted octave band (OB) SPLs (outdoors).

Township of Old Bridge

The Land Development Ordinance for the Township of Old Bridge (Section 4.a ["Performance Standards", pp. 7-35 to 7-37]), which also applies to Compressor Station 207, requires that noise not exceed 50 dBA during daytime or nighttime outside of the lot on which the use or source of sound is located, and that the noise not exceed the allowable maximum unweighted OB SPLs. Based on an interpretation of the noise standard, "outside of the lot" is intended to refer to the lot/property of any noise-sensitive area, such as a residential lot/property.

4.11.2.3 Noise Level Impacts and Mitigation

Construction Noise

Offshore Pipeline Construction

Transco calculated the maximum sound level (L_{max}) of equipment noise associated with the offshore pipe lay barge at varying distances. The calculations were adjusted to take into account the

predicted time (or usage factor) that the equipment would produce noise on the job site and the number of pieces of each type of equipment to be used. The combined noise level at the shoreline, approximately 3,600 feet from the nearest proposed pipe laying activity, is estimated to be 51 dBA. This would be less than the typical ambient noise level in the vicinity of the shore, which is dominated by noise from the ocean and wind, with intermittent contributions from birds.

Horizontal Directional Drilling

Noise would be generated by equipment operating at both the HDD entry and exit locations. The HDD exit would be located approximately 3,600 feet offshore. As such, HDD noise at the exit location may have an effect on aquatic organisms (see the discussion of acoustic impacts in Sections 4.5.2, 4.5.3, and 4.7) but is unlikely to be noticeable from the shore. An acoustical analysis was conducted to determine impacts to NSAs from onshore HDD activities associated with the Rockaway Project. The details of that analysis are described in this section. Figure 4.11.2-1 shows each NSA and its proximity to the HDD entry point, which is closer to the nearest NSAs than the exit location mentioned above.

The HDD onshore entry location, which is the closest point to the NSAs, would include the drill rig. The operation of the drill rig and other equipment would generate relatively high noise levels during the 8 to 10 weeks Transco estimates for the onshore HDD operation, including noise that would occur 24 hours per day, 7 days per week, during reaming and pullback activities.

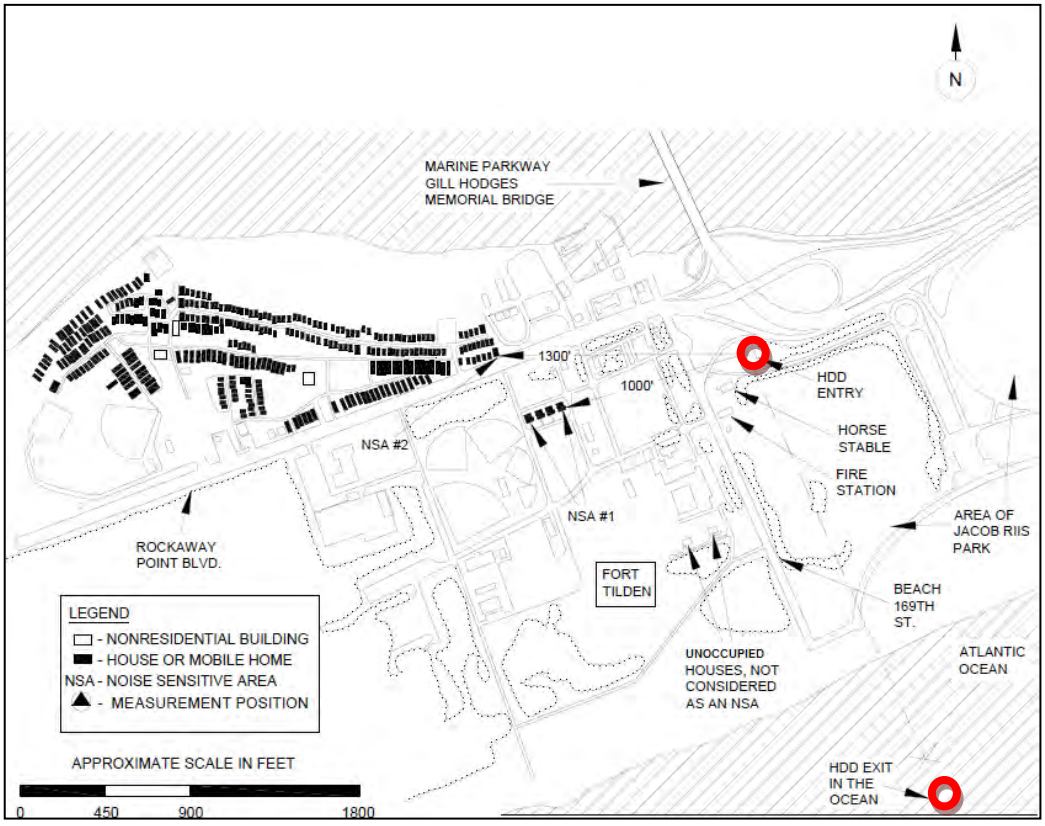

Figure 4.11.2-1 NSAs Closest to HDD Entry Point

The two NSAs nearest the HDD entry point are NSA no. 1 (residences located 1,000 feet to the west-southwest) and NSA no. 2 (residences located 1,300 to the west). Without noise mitigation measures in place, the noise levels from HDD operations would produce a significant increase in noise levels over ambient levels. Ambient levels at both NSAs were measured at 50.6 dBA. HDD operations would increase the noise levels to 60.9 dBA at NSA no. 1 and 58.2 dBA at NSA no. 2. These levels would exceed the FERC's sound level guideline of 55 dBA.

The acoustical analysis estimated the noise levels at nearby NSAs provided the following noise mitigation measures are employed:

- use of a partial "close-fit" temporary noise barrier around the hydraulic pumping unit;
- use of a partial "close-fit" temporary noise barrier around each engine-driven pump;
- use of a "low-noise" generator for the mud/cleaning system;
- orientation of the engine-driven pump(s) such that the engine JW cooler faces away from the closest NSA; and
- use of an adequate exhaust silencer on diesel-driven engines for stationary equipment and mobile equipment.

With the use of the above mitigation measures, the estimated HDD noise contribution at NSAs no. 1 and no. 2 would be 53.6 and 52.4 dBA, respectively. Both of these levels are less than the 55 dBA sound guideline. Additionally, noise along the shoreline at Rockaway Beach would be less than 55 dBA with the implementation of these measures.

Consistent with Local Law 113 of the City of New York, Transco would submit a site-specific noise mitigation plan to the FERC as part of the Implementation Plan for the Rockaway Project, which would contain measures that would mitigate noise below the levels outlined above. Transco would also obtain an after-hours work authorization from New York City for drilling prior to conducting any HDD operations between the hours of 6:00 pm and 7:00 am.

To ensure that the site-specific noise mitigation plan contains the measures recommended in the acoustical assessment to limit noise contributions from the HDD entry point at nearby NSAs to predicted levels, **we recommend that**:

- **Prior to construction of the Rockaway Delivery Lateral, Transco should file with the Secretary a site-specific noise mitigation plan for the HDD onshore entry location for review and written approval by the Director of OEP that incorporates the noise mitigation measures recommended in Report No. 2825 by Hoover and Keith, Inc.; identifies any deviations from these recommendations with stated justification; and specifies any additional or alternate mitigation that would be employed.**

M&R Facility Construction

Construction of the M&R facility would include modifications and rehabilitation of the existing hangars, and the operation of equipment necessary to install the heaters and other meter and regulating equipment. These activities would increase noise levels in the vicinity of the site. As noted above and as shown in Figure 4.11.2-2, Transco identified five NSAs in the vicinity of the M&R facility.

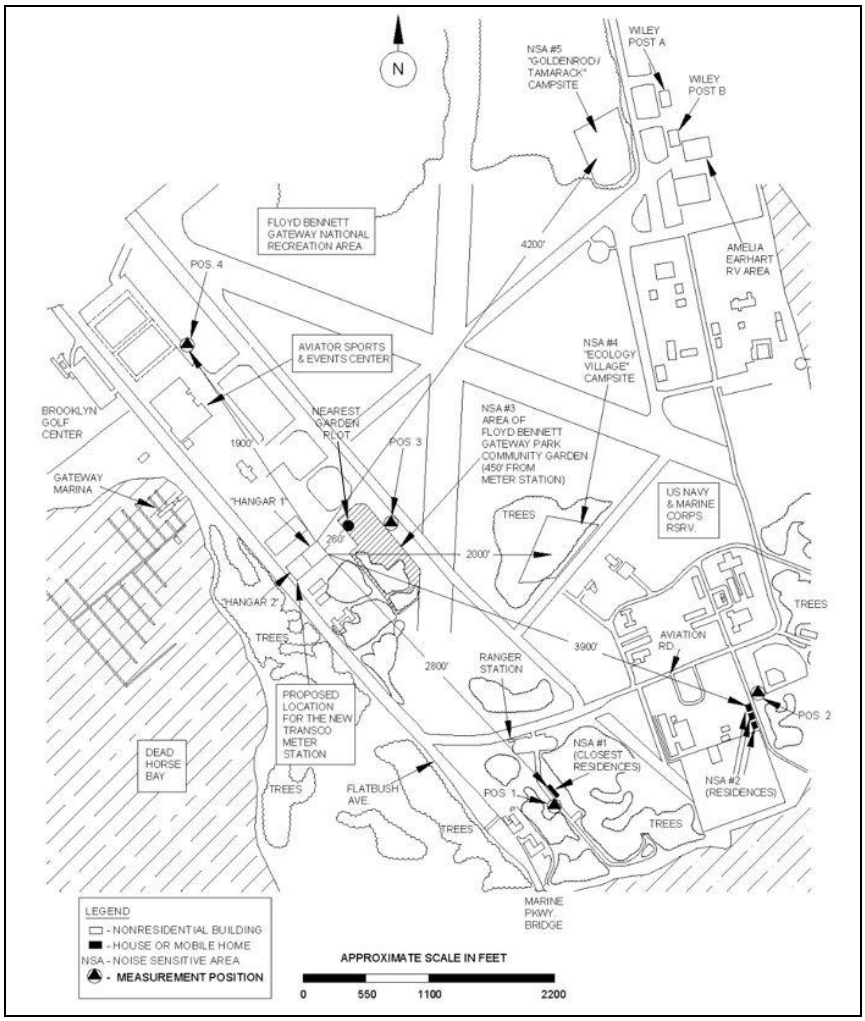

Figure 4.11.2-2 NSAs Closest to the M&R Facility

The proposed modifications at the hangar complex include pile driving outside the hangars for sheeting that would be hammered into the ground to support the building walls, excavating trenches for the new pilings and equipment foundations, and pile driving inside the hangars at the location of each proposed piece of equipment/skid, including underground piping and headers. The noise associated with these activities was calculated based on the period when pile driving and the largest amount of construction equipment would be operating. Table 4.11.2-8 lists the estimated sound contribution of construction activities at the identified NSAs during this period.

TABLE 4.11.2-8
Noise Quality Analysis Related to Temporary Construction Activities at the M&R Facility for the Rockaway Project

NSA No.	Maximum Sound Level (L_{dn}) During Construction (dBA)	Ambient L_{dn} (dBA)	Sound Level (L_{dn}) of Construction Plus Ambient Level (L_{dn}) (dBA)	Estimated Increase Above Ambient Level (dB)
1	41.4	48.7	49.4	0.7
2	36.5	48.9	49.1	0.2
3	62.3	48.4	62.4	14.0
Closest garden plot	64.4	48.4	64.5	16.1
4	46.3	48.4	50.5	2.1
5	34.9	48.9	49.1	0.2

[a] Ambient noise at this location was assumed to be similar to NSA no. 3, which is nearby.

The results indicate that the maximum estimated increase in noise at four of the five NSAs would be less than 2.1 dBA, which is less than what is considered detectable by the human ear. The estimated increase in noise at NSA no. 3, which is located on the northeast side of the Floyd Bennett Gateway Park Community Garden, would be 14 dBA and would be noticeable. We received comments that several parts of the community garden plots are closer to the hangars than NSA no. 3 and that noise at these areas would be higher. We determined that the nearest garden plots to the M&R facility would be about 260 feet from the closest hangar. At this distance, the maximum estimated increase in noise from construction would be 16.1 dBA for a maximum sound level of 64.4 dBA. These noise levels would occur during peak construction periods and would be lower much of the rest of the time.

Though the noise levels above include the noise produced during pile driving activities, it is important to note that the maximum amount of noise produced from this activity would be 115 dBA within the hangar. At a distance of 50 feet, noise from pile driving is estimated to be 80 to 85 dBA. Noise from pile driving activities could occur between the hours of 7:00 a.m. to 10:00 p.m., which are considered daytime hours.

Northeast Connector Project Construction Noise

Noise-generating construction activities at Compressor Station 195 would consist of the following: removing the existing engine drives for compressor units 1, 2, and 3 and replacing them with two new electric motor drives; jack-hammering existing foundations inside the compressor building; installing a new electrical substation and variable frequency drive building; earth moving activities; and the use of various power tools (e.g., generators, air compressors, impact drills, and welding equipment). As noted in Section 4.11.2.1 above, Transco identified three NSAs in the vicinity of Compressor Station 195. Transco's noise analysis indicates that the noise level at each NSA would be equal to or less than 55 dBA during construction.

The planned modifications at Compressor Stations 205 and 207 for the Northeast Connector Project would consist of replacing/modifying existing equipment at each site. This would be achieved primarily with a software change to the motor controls to allow the existing electric motors to run at a higher hp. This would not result in any construction-related noise at the sites.

Operational Noise

Pipeline Operation and Maintenance Activities

Operation of the Rockaway Delivery Lateral is not expected to generate significant noise levels because no natural gas compressor stations are planned for the Rockaway Project. Ongoing maintenance activities for the pipeline that have the potential to generate noise would include inspecting, cleaning, and, as necessary, repairing the pipeline. As described in Section 4.12.1, pigging operations to inspect the interior of the pipeline would be conducted approximately once every 7 years at the subsea manifold located near the LNYBL more than 2.5 miles offshore. In addition to the pigging operations, periodic onshore ground inspections and annual leak detection surveys (see Section 4.12.1) would be conducted to identify soil/sediment erosion that may expose the pipe or dead vegetation that may indicate a leak in the line. The noise generated by these maintenance activities would occur intermittently and for short durations and as such would have a negligible noise impact.

M&R Facility Operation and Maintenance Activities

During operation of the M&R facility, noise would be radiated from aboveground piping associated with the regulator valves. The level of piping noise would be directly related to the pressure drop and gas flow across the flow control valves (FCVs) associated with the regulator runs inside Hangar 1. Noise would also be generated by equipment located inside Hangar 2 such as the electric motor-driven pumps and heat exchangers. We calculated the total estimated noise that could be generated by the facility based on operating conditions that would generate the highest amounts of noise and the effect of this noise at the five NSAs closest to the facility as evaluated by Transco. We did the same for the closest Community Garden plot to the proposed M&R facility site. The results are listed in Table 4.11.2-9.

TABLE 4.11.2-9
Noise Quality Analysis Related to Operational Activities at the M&R Facility for the Rockaway Project

NSA No.	Maximum Sound Level (L_{dn}) of M&R Facility (dBA)	Ambient L_{dn} (dBA)	Sound Level (L_{dn}) of M&R Facility Plus Ambient Level (L_{dn}) (dBA)	Estimated Increase Above Ambient Level (dB)
1	25.1	48.7	48.7	0.0
2	20.8	48.9	48.9	0.0
3	44.0	48.4	49.8	1.4
Closest Garden Plot	44.5	48.4 [a]	49.9	1.5
4	29.0	48.4	48.4	0.0
5	20.8	48.9	48.9	0.0

[a] Ambient noise at this location was assumed to be similar to NSA no. 3, which is nearby.

The results of the acoustical assessment indicate that the noise attributable to the M&R facility should be significantly lower than an L_{dn} of 55 dBA at any nearby NSA and the change in the noise level would likely be undetectable to the human ear.

Compressor Station 195

As discussed in Section 2.1.3, Transco proposes to modify Compressor Station 195 by replacing three existing natural gas-fired reciprocating engines and appurtenant facilities with two new electric motor drives; installing a new 35-kv substation, variable frequency drive building, and associated coolers;

modifying the existing compressor units to be driven by the new electric motors; and modifying station piping and valves. During operations, noise would be generated by the new electric motors and associated components (such as coolers), variable frequency drive, aboveground piping, and transformers in the substation as well as existing equipment at the site. Noise additionally would result from the ventilation of air exhaust from each new motor drive.

Transco's consultant Hoover and Keith, Inc. (H&K) calculated the total estimated noise that could be generated at Compressor Station 195 as a result of the Northeast Connector Project based on operating conditions that would generate the highest amounts of noise. Specifically, H&K estimated the sound contribution of the proposed modifications at the nearby NSAs (see Figure 4.11.2-3). The results of this analysis are provided in Table 4.11.2-10.

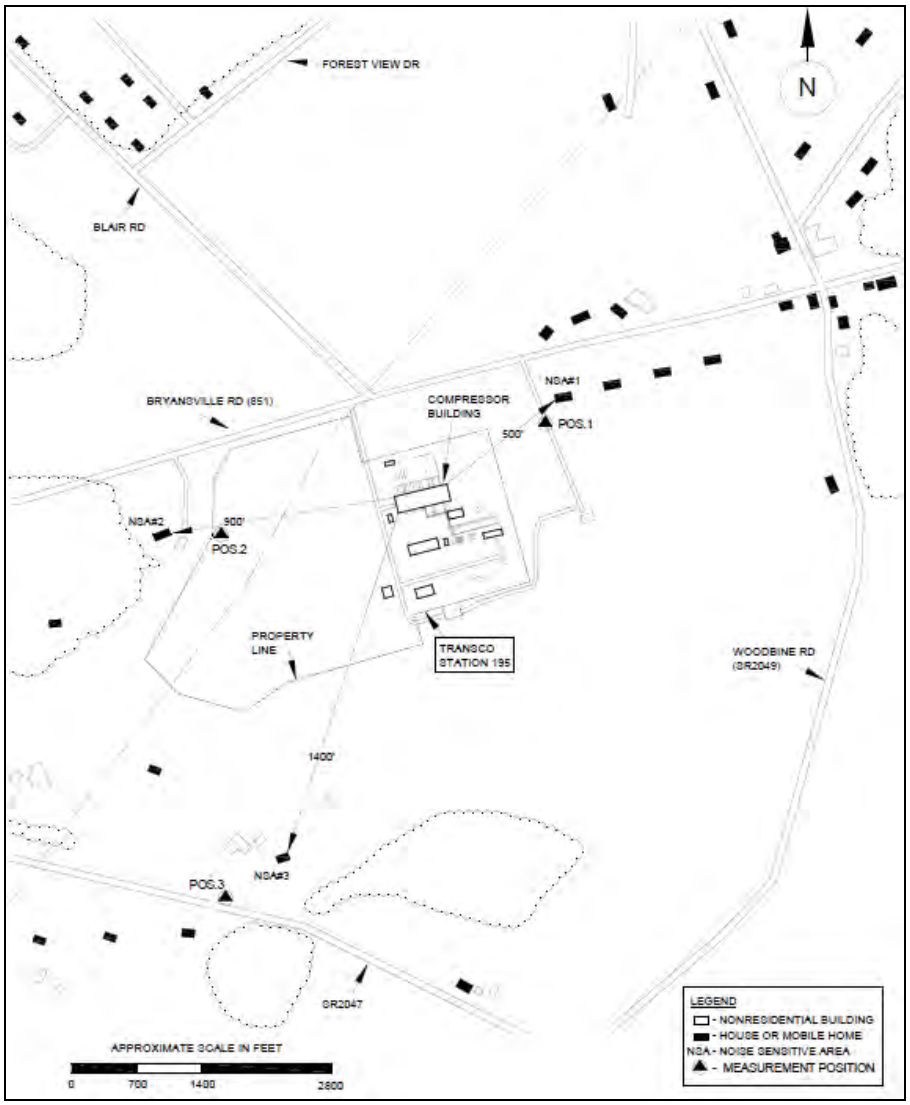

Figure 4.11.2-3 NSAs Closest to Compressor Station 195

TABLE 4.11.2-10
Noise Quality Analysis Related to Operational Activities at Compressor Station 195 for the Northeast Connector Project

Closest Residences (NSAs)	Measured Sound Level Attributable to Existing Station at 74% Load (L_{dn}) (dBA)	Estimated Sound Level of Existing Station at Full Load (L_{dn}) [a] (dBA)	Estimated Sound Level of Station if Units 1, 2, and 3 are Removed [b] (dBA)	Estimated Sound Level of New Electric Drive Units 1 and 2 (Ldn) (dBA)	Estimated Station Sound Level (L_{dn}) after Project Modifications (dBA)	Potential Noise Increase (+) or Decrease (-)(dBA)
NSA no. 1	56.9	58.2	54.3	53.0	56.7	-1.6
NSA no. 2	54.2	55.5	51.6	50.5	54.1	-1.4
NSA no. 3	48.0	49.3	45.4	45.9	48.7	-0.6

[a] Compressor Station 195 was operated at 74 percent of full capacity during the sound survey (i.e., 14,450 hp of the full capacity of 19,640 hp); 1.3 dB was added to the measured sound level at the nearby NSAs (i.e., 10*log(19,460/14,450) = 1.3 dB) to represent the maximum estimated sound level at the nearby NSAs if the station was operated at full capacity (i.e., all units operating at full load).

[b] As related to the proposed modifications, the engine-drive for units 1 and 2 would be replaced and unit 3 would be decommissioned. As a result, the estimated station sound level without units 1, 2, and 3 operating would be approximately 3.9 dBA lower than the current station full load sound level (i.e., after removing hp associated with Units 1, 2, and 3, the remaining station hp would be 8,000 hp, which is 3.9 dBA lower than the current station level (10*log(19,460/8,000) = 3.9 dB). This estimated resulting station sound level is utilized for the acoustical analysis related to the installation of the new electric motor/compressor for units 1 and 2, which replaces the existing engine-driven compressor units 1 and 2.

As shown in the table, the predicted noise levels at each of the NSAs would decrease as a result of the proposed modifications at Compressor Station 195. The predicted noise levels at NSAs no. 2 and no. 3 would be less than the 55 dBA limit set by the FERC. The predicted noise level at NSA no. 1 would exceed this threshold by 1.7 dBA, but would be less than the measured values for current ambient conditions at full load operations. This predicted noise level is based on Transco's commitments to implement all of the noise control measures specified in H&K's Report No. 2385 to reduce noise from Compressor Station 195, including the following:

- the building enclosing compressor units 1 and 2 would be modified to provide adequate attenuation of the noise generated by the new electric motor-driven compressor units; modifications may include a new ventilation system and replacement of the roof and wall siding;
- any new air supply wall fan would not exceed 50 dBA from 50 feet;
- acoustical pipe installation would be employed for new outdoor gas piping;
- each outdoor cooler for the variable frequency drive would not exceed 56 dBA at a distance of 50 feet;
- each lube oil cooler would not exceed 56 dBA at 50 feet;
- the motor air cooling blower would be located inside the building for the new compressor; the sound level of the blower would not exceed 50 dBA at a distance of 50 feet; and
- exhaust air would be sent through an opening located on one of the building walls such that the sound level generated from the motor exhaust would not exceed 50 dBA at a distance of 50 feet.

To ensure that the noise from modified Compressor Station 195 would not exceed previously existing noise levels at NSA no. 1 and would not exceed an L_{dn} of 55 dBA at NSAs no. 2 and 3, **we recommend that:**

- **Transco should file a noise survey with the Secretary no later than 60 days after placing the modified Compressor Station 195 in service for the Northeast Connector Project. If a full load condition noise survey is not possible, Transco should provide an interim survey at the maximum possible hp load and provide the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at Compressor Station 195 under interim or full hp load conditions exceeds existing noise levels at NSA no. 1 or an L_{dn} of 55 dBA at NSAs no. 2 and no. 3, Transco should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Transco should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

Compressor Station 205

Transco proposes to add an incremental 5,000 hp of compression at Compressor Station 205 by uprating two existing electric motor drives and modifying the associated compressor units. In May 2013, Transco filed a study by H&K that calculated the sound contribution of these modifications at nearby NSAs (see Figure 4.11.2-4). As shown in Table 4.11.2-11, the results of H&K's analysis indicate that the sound level attributable to operation of Compressor Station 205 following the uprate would be less than the FERC sound requirement of 55 dBA at the nearby NSAs. In addition, the results indicate that the sound levels at the compressor station would be below the sound level limits of the New Jersey Noise Control Act.

TABLE 4.11.2-11
Noise Quality Analysis of Modified Compressor Station 205 for the Northeast Connector Project

Closest Residences (NSAs)	Noise Contribution of Existing Compressor Station 205 (L_{dn}) (dBA)	Estimated Noise Contribution Increase due to Station Modifications (dBA)	Noise Contribution (L_{dn}) after Station Modifications (dBA)
NSA no. 6	50.6	0.7	51.3
NSA no. 7	50.4	0.7	51.1

The study by H&K also calculated the A-weighted sound levels at the property lines for Compressor Station 205 following the proposed modifications. These values are estimated to range from 43.9 to 47.2 dBA, which are less than the A-weighted sound level of 50 dBA, nighttime, as required by Transco's agreement with Lawrence Township for noise at the property line. Although the property lines of Compressor Station 205 are closer to the compressor equipment than the nearest NSAs, noise levels at the NSAs would be higher than at the compressor station property lines due to the existing ambient noise conditions at each NSA. The sounds of vehicle traffic and insects are the dominant noise sources at each NSA.

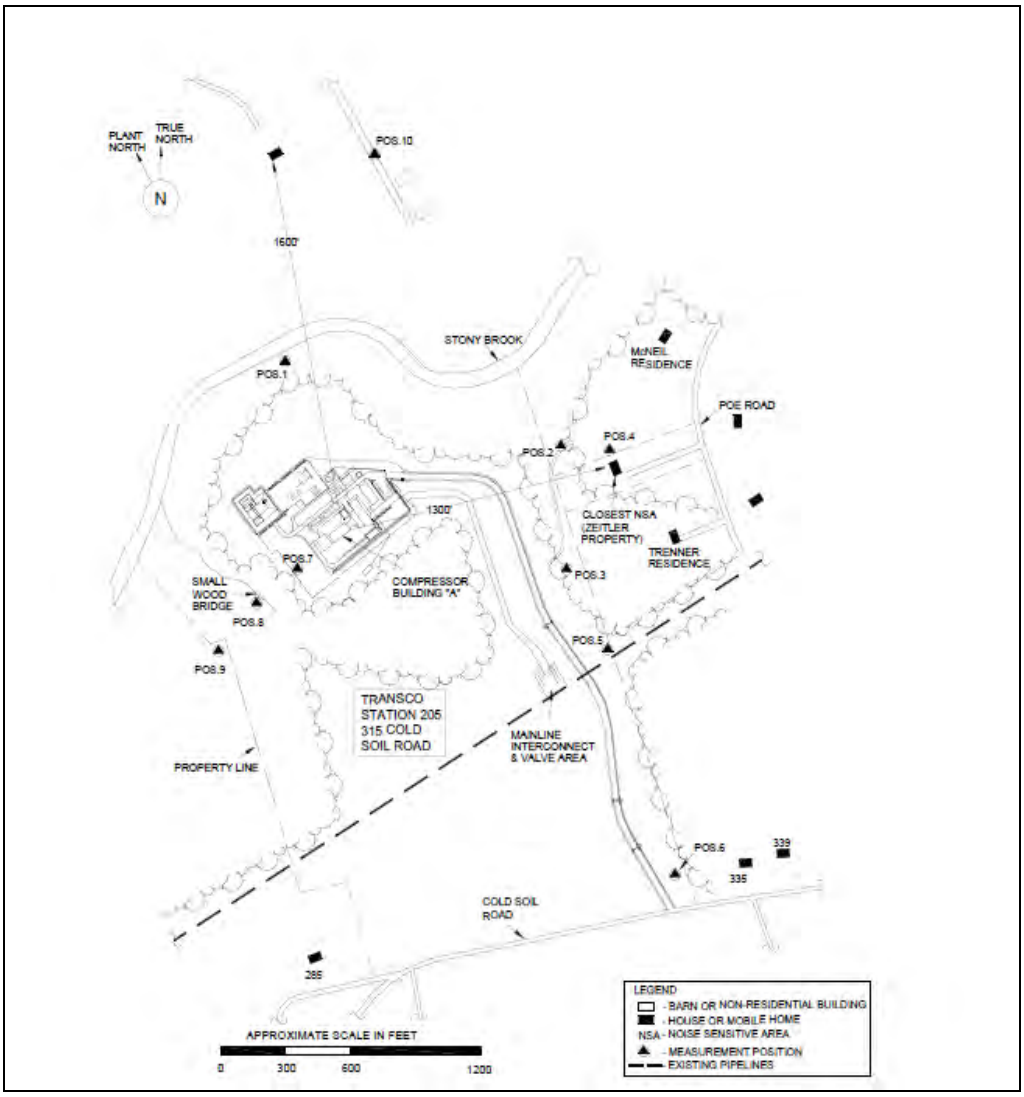

Figure 4.11.2-4 NSAs Closest to Compressor Station 205

In August 2013, Transco filed a more recent survey for Compressor Station 205 under Docket No. CP12-463-000 that measured noise levels at nearby NSAs following the replacement of two existing electric motors with two new electric motors at the site. The results of this survey showed that noise contributed by the compressor station at full load conditions exceeded an L_{dn} of 55 dBA at one NSA. In September 2013, Transco filed a plan with the Secretary to implement additional mitigation measures at Compressor Station 205 to reduce noise levels at this NSA. Specifically, Transco committed to installing temporary noise barriers and replacing coolers associated with the new electric motor drives at the site. These measures are expected to reduce noise levels at the NSA to less than 55 dBA.

To ensure that noise from Compressor Station 205 following the proposed hp uprate for the Northeast Connector Project would not exceed an L_{dn} of 55 dBA, **we recommend that**:

- **Transco should file a noise survey with the Secretary no later than 60 days after placing the modified Compressor Station 205 in service for the Northeast Connector Project. If a full load condition noise survey is not possible, Transco should provide an interim survey at the maximum possible hp load and provide the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at Compressor Station 205 under interim or full hp load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, Transco should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Transco should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

Compressor Station 207

Transco proposes to add an incremental 5,400 hp of compression at Compressor Station 207 by uprating two existing electric motor drives and modifying associated gearboxes. H&K calculated the sound contribution of these modifications at the nearby NSAs (see Figure 4.11.2-5). As shown in Table 4.11.2-12, the results of H&K's analysis indicate that the sound level attributable to operations at Compressor Station 207 following the uprate would be less than the FERC sound requirement of 55 dBA at the nearby NSAs and below the sound levels required under the New Jersey Noise Control Act and the local noise ordinances.

TABLE 4.11.2-12
Noise Quality Analysis of Modified Compressor Station 207 for the Northeast Connector Project

Closest Residences (NSAs)	Noise Contribution of Existing Compressor Station 207 (L_{dn}) (dBA)	Estimated Noise Contribution Increase due to Station Modifications (dBA)	Noise Contribution (L_{dn}) after Station Modifications (dBA)
NSA no. 8	35.5	1.9	37.4
NSA no. 9	34.7	1.9	36.6
NSA no. 10	36.0	1.9	37.9

To ensure that noise from Compressor Station 207 following the hp uprates would not appreciably exceed the relatively quiet noise levels attributable to the operation of the existing station at nearby NSAs, **we recommend that**:

- **Transco should make all reasonable efforts to ensure its predicted noise levels from Compressor Station 207 are not exceeded at nearby NSAs and file noise surveys showing this with the Secretary no later than 60 days after placing the modified Compressor Station 207 in service for the Northeast Connector Project. If a full load condition noise survey is not possible, Transco should provide an interim survey at the maximum possible horsepower load and provide the full load survey within 6 months. If the noise attributable to the operation of Compressor Station 207 at interim or full hp load exceeds an L_{dn} of 55 dBA at any nearby NSAs, Transco should file a report on what changes are needed and should install additional noise controls to meet the level within 1 year of the in-service date. Transco should confirm compliance with this requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

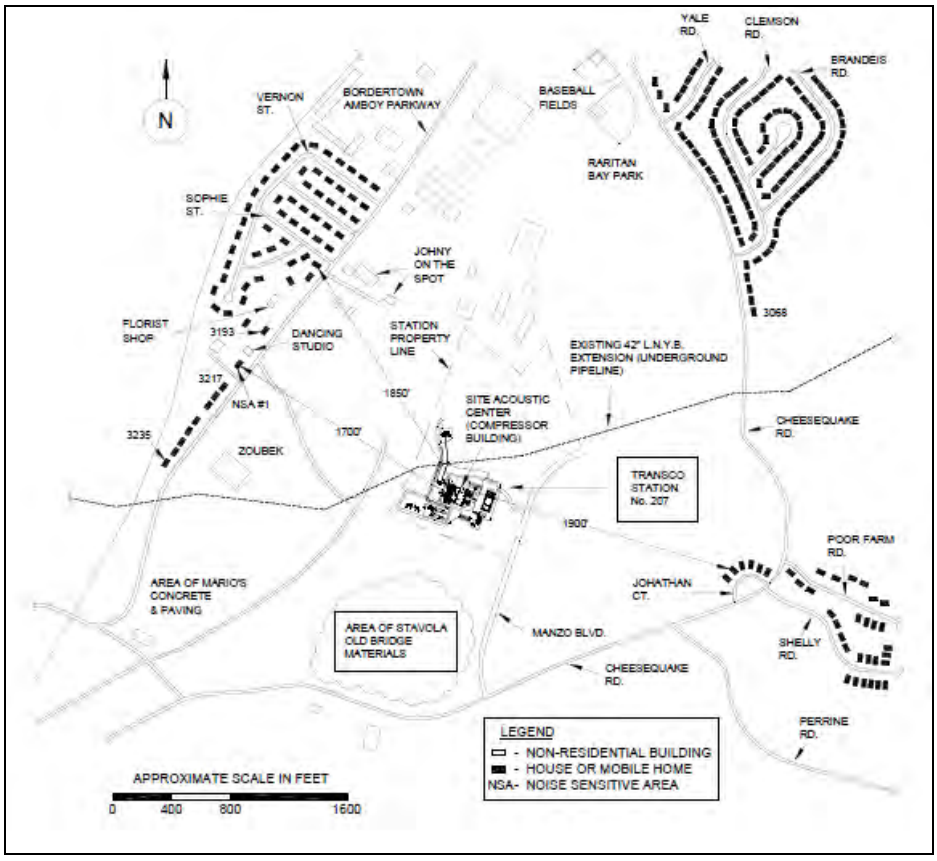

Figure 4.11.2-5 NSAs Closest to Compressor Station 207

4.11.3 Vibration

Rockaway Project

Vibration refers to oscillatory movement in a solid object, such as the ground or a structure, measured as acceleration, velocity, or displacement. Transco commissioned a study to assess the effects of vibration during construction and operation of the proposed M&R facility on the historic hangar complex at Floyd Bennett Field as well as on nearby receptor sites such as the Floyd Bennett Gateway Park Community Garden (AKRF, 2013). The study measured vibration as acceleration in dB referenced to 1 micro-inch per second and as peak particle velocity (PPV) in inches per second. Vibration levels measured as acceleration in dB are expressed across a spectrum of frequencies for the vibration. Frequency is the rate at which acceleration, velocity, or displacement fluctuates in a cycle over a given quantity of time, and is measured in Hz, where 1 Hz equals one cycle per second.

The New York City Department of Buildings (NYCDOB) established vibration level criterion for avoidance of architectural or structural damage to historic buildings in its Technical Policies and Procedures Notice No. 10/88. Under this notice, the PPV from construction vibration is not permitted to exceed a vibration damage threshold criterion of 0.5 inches per second at historic buildings. This is the threshold level above which a building could experience architectural or structural damage. It is also consistent with the Federal Transit Administration's (FTA's) threshold for architectural damage to reinforced-concrete, steel, or timber buildings as referenced in Chapter 12, "Construction" of the FTA's *Transit Noise and Vibration Impact Assessment* guidance manual (FTA, 2006).

Existing Vibration Levels

Transco measured ambient vibration levels at three positions near the proposed M&R facility site: at the southwest corner of Hangar 2, at the southeast corner of Hangar 2, and at a point located 272 feet east of Hangar 2. The vibrations measured at these locations were attributed to vehicle traffic along Flatbush Avenue and to vehicle and helicopter traffic at Floyd Bennett Field. At all three locations, ambient vibrations were determined to be less than 50 dB at frequencies less than 1,000 Hz, which is below the human limit of perception for vibration (humans begin to detect vibrations at levels ranging from about 78 dB at 2 Hz to 120 dB at 500 Hz). The ambient vibrations measured by the study are also below the vibration damage threshold criterion of 0.5 inches per second for historic buildings.

Vibration during Construction

Transco assessed the potential of vibration from construction activities (such as pile driving, jackhammering, or operating delivery trucks) to cause architectural or structural damage to the hangar complex. The analysis found that individual pieces of equipment (such as a pile driver or jackhammer) operating at distances ranging from 5 to 10 feet from the hangars would not damage the structures (i.e., the individual vibrations of these operating pieces of equipment would be less than the vibration damage threshold criterion of 0.5 inch per second for historic buildings). However, the analysis found that the simultaneous operation of multiple pieces of equipment or operation of equipment within 5 to 10 feet from the hangar walls could result in vibrations greater than 0.5 inch per second and potentially cause damage. The study suggested that Transco identify a vibration level threshold for the hangar and prepare and implement a CPP, to include vibration monitoring, survey monitoring for movement of the building, and crack gauge monitoring, at the hangars during construction.

Transco filed a CPP (also referred to as a Building Protection Plan) for the hangar complex in October 2013 (GZA GeoEnvironmental, Inc., 2013). The CPP identified a vibration level threshold of 0.5 inch per second (consistent with the requirements of the NYCDOB) and described procedures for continuous vibration monitoring in and around the hangars and nearby structures. To complete the monitoring, Transco would deploy 11 seismographs equipped with cellular modems to provide automated data reporting on vibration levels inside and outside the hangars. The CPP also identified thresholds and monitoring procedures for vertical and horizontal movement of the buildings and the thickness of existing cracks in the structures. The threshold for vertical and horizontal movement would be 0.25 inch as monitored by measuring the positions of fixed optical survey points placed on the outside of the structures. Crack gauges would be used to monitor the thickness of existing cracks with a threshold level of 0.04 inch for measuring changes. An onsite engineer would have stop-work authority in the event that any of the monitoring thresholds are exceeded, and corrective actions would be implemented, as appropriate, to protect the integrity of the structures during construction.

Vibration during Operations

Transco assessed the potential of vibration from operation of the M&R facility to affect the integrity of the hangar complex or disturb other users of Floyd Bennett Field. Transco measured vibration levels on the gas pipeline and in the ground near an existing M&R facility in Linden, New Jersey, which was determined to be comparable to the proposed M&R facility in terms of size and equipment. Transco then compared the measured values to existing ambient conditions at the proposed M&R facility site to extrapolate PPV levels in the vicinity of the hangars during operations.

The measured vibration levels at the existing M&R facility in Linden, New Jersey ranged between about 90 and 110 dB at low-end frequencies on the gas pipeline, but were less than 60 dB in the ground at distances ranging from 26 to 54 feet from the structure. Based on these measurements, operation of the proposed M&R facility would result in a vibration level about 15 dB higher than the measured levels adjacent to Hangar 2 at frequencies below 400 Hz. These levels would be below the human limit of perception to vibration and would not be felt by other users of Floyd Bennett Field. The study also found that the PPV at the proposed M&R facility would exceed the vibration damage threshold criterion of 0.5 inches per second on the pipelines entering the hangar. Vibrations on the pipelines during operations would not affect the integrity of the hangar provided that a minimum buffer of 1 inch is maintained between the pipelines and the building (including support piles for the building) where the pipelines enter and exit the structure. The pipelines would enter/exit the hangar underground and between the piles supporting the structure to maintain this buffer.

Northeast Connector Project

Neither Pennsylvania nor New Jersey have regulations specific to vibration requirements that would be applicable to the Northeast Connector Project. Transco's noise evaluation indicates that vibration levels at Compressor Station 195 would decrease as a result of the proposed modifications at the site. No change in vibration levels are expected as a result of the proposed upgrades at Compressor Stations 205 and 207.

4.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for an accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

CH_4, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. Exposures to high concentrations can result in serious injury or death due to oxygen deficiency. The specific gravity (SG) of CH_4 is 0.55, which is lighter than air (SG 1.0). This means that CH_4 tends to rise at normal atmospheric temperature and pressure dispersing rapidly in the atmosphere. CH_4 has an auto-ignition temperature of 1,000 °F and is flammable at concentrations between 5 and 15 percent CH_4 by volume. In general, unconfined mixtures of CH_4 in air are not flammable or explosive because CH_4 is diluted by nitrogen and oxygen in the atmosphere. A flammable concentration within an enclosed space in the presence of an ignition source can explode. A chemical odorant would be added to the natural gas to produce the familiar "natural gas smell."[29] CH_4 is inactive biologically and essentially nontoxic. It is not listed in the International Agency for Research on Cancer, National Toxicology Program, or by the Occupational Safety and Health Administration (OSHA) as a carcinogen or potential carcinogen.

4.12.1 Safety Standards

The DOT is mandated to provide pipeline safety under 49 USC Chapter 601. The Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards that set a level of safety to be attained and allow the pipeline operator to use various technologies to achieve the required safety standard.

The PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. In New York, this work is shared with the NYSPSC's Office of Electric, Gas and Water. Through certification by the OPS, New York State regulates and inspects both intrastate and interstate gas and liquid pipeline operators, though the OPS is responsible for enforcement actions on interstate facilities. In Pennsylvania and New Jersey, PHMSA's safety and inspection responsibilities are shared with the Pennsylvania Public Utility Commission's Gas Safety Division and New Jersey Board of Public Utilities' Bureau of Pipeline Safety, respectively. Through certification by OPS, each state agency regulates and inspects intrastate gas pipeline operators within its state boundaries, whereas the OPS regulates and inspects interstate gas and both interstate and intrastate liquid pipeline operators.

The DOT pipeline standards are published in 49 CFR Parts 190–199. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues. Under an MOU on Natural Gas Transportation Facilities dated January 15, 1993 between the DOT and the FERC, the DOT is recognized as having the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations requires that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection, or certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards other than the DOT standards. If the Commission becomes aware

[29] The gas to be delivered into the proposed pipeline is odorized upstream of the LNYBL.

of an existing or potential safety problem, there is a provision in the MOU to promptly alert the DOT. The MOU provides instructions for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC participates as a member of the DOT's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the Projects would be designed, constructed, operated, and maintained in accordance with or to exceed the DOT Minimum Federal Safety Standards in 49 CFR Part 192. These regulations, which are intended to protect the public and to prevent natural gas facility accidents and failures, include specifications for material selection and qualification; minimum design requirements; and protection of pipelines from internal, external, and atmospheric corrosion.

The Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011 (U.S. House of Representatives 2845) was passed by Congress and signed into law on January 3, 2012 by President Barack Obama. Among other things, this Act states that no later than 2 years after the date of enactment, after considering factors specified in the Act, the DOT Secretary, if appropriate, shall require by regulation the use of automatic or remote control shut-off valves, or equivalent technology, where economically, technically, and operationally feasible on transmission pipeline facilities constructed or entirely replaced after the date on which the Secretary issues the final rule containing such requirement. Although these regulations have not yet gone into effect and would apply to pipelines built in the future, Transco committed to the use of automatic shut-off valves on the proposed Rockaway Delivery Lateral.

The DOT defines area classifications, based on population density in the vicinity of a pipeline, and specifies more rigorous safety requirements for populated areas. Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, MAOP, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must conform to higher standards in more populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1.0-mile length of pipeline. The four area classifications are defined below:

- Class 1: Location with 10 or fewer buildings intended for human occupancy;
- Class 2: Location with more than 10 but less than 46 buildings intended for human occupancy;
- Class 3: Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period; and
- Class 4: Location where buildings with four or more stories aboveground are prevalent.

In accordance with federal standards, class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil or 24 inches in consolidated rock. Offshore pipelines constructed in less than 12 feet of water, as

measured from the mean low tide, must have a minimum cover of 36 inches in soil and 18 inches in consolidated rock. Offshore pipelines constructed in 12 to 200 feet of water, as measured from the mean low tide, must be installed so that the top of the pipe is below the natural bottom unless the pipeline is protected by some other means such as a heavy concrete coating. Class locations specify the maximum distance to sectionalized block valves (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4).

The proposed 26-inch-diameter Rockaway Delivery Lateral would extend from Transco's existing 26-inch-diameter LNYBL in the Atlantic Ocean for about 3.2 miles to an onshore delivery point on the Rockaway Peninsula in Queens County, New York. About 2.6 miles (81 percent) of the proposed 26-inch-diameter pipeline would be located in Class 1 areas, and 0.60 mile (19 percent) would be located in Class 3 areas. A summary of class locations based on current population density along the proposed pipeline route is provided in Table 4.12.1-1.

TABLE 4.12.1-1
Area Classifications along the Rockaway Delivery Lateral

Milepost Range	Length (miles)	Required Class Location	Design Class Location
0.00R to 0.04R	0.04	1	4
0.00R to 2.56R	2.56	1	4
2.56R to 3.16R	0.60	3	4

If the Rockaway Project is approved, the DOT regulations require that the pipeline be designed, at a minimum, to the appropriate Class location standard and that the spacing between mainline valves meets DOT requirements. Transco proposed a more robust design for the Rockaway Delivery Lateral. Specifically, Transco committed to design its proposed pipeline in accordance with Class 4 standards. With the exception of the HDD segment of the pipeline, which would be installed at a greater depth, Transco would bury the offshore portion of the proposed pipeline at a minimum depth of 48 inches below grade (i.e., the top of the pipe would be at least 48 inches below the surface). Onshore, from the HDD entry point to the tie-in with National Grid, Transco would bury the pipeline at a minimum depth of 36 inches below grade (i.e., the top of the pipe would be at least 36 inches below the surface) and would also cover the pipeline with a concrete slab. Transco additionally would monitor pipeline pressures 24 hours per day. Thus, the design for the proposed pipeline would exceed the requirements of PHMSA Safety Standards in 49 CFR Part 192.

Additionally, Transco would implement the safety measures listed below to meet or exceed minimum federal requirements for the Rockaway Delivery Lateral:

- the pipe material would meet and generally exceed API specification 5L requirements, which provides standards for pipe suitable for use in conveying gas, water, and oil;
- 40 percent of the steel strength in the pipe material would be utilized to contain natural gas when operated at 1440 psig;
- all girth welds would be non-destructively tested;
- Class 4 design pipe would be installed in all areas to increase the safety factor;
- the new pipeline would be hydrostatically tested above the minimum required test pressure; and
- additional depth of cover may be provided at certain locations.

The Pipeline Safety Improvement Act of 2002 requires operators to develop and follow a written integrity management program that contains all the elements described in 49 CFR Part 192.911 and addresses the risks on each transmission pipeline segment. Specifically, the law establishes an integrity management program that applies to all high consequence areas (HCAs).

The DOT published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for the DOT to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. In the first method, an HCA includes:

- current Class 3 and 4 locations;
- any area in Class 1 or 2 locations where the potential impact radius [30] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle [31]; or
- any area in Class 1 or 2 locations where the potential impact circle includes an identified site.

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

In the second method, an HCA includes any area within a potential impact circle that contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

The HCAs have been determined based on the relationship of the pipeline centerline to other nearby structures and identified sites. Approximately 0.6 mile or about 19 percent of the area along the proposed route for the Rockaway Delivery Lateral would be classified as HCA, all of which is located between MPs 2.56 and 3.16.

Once a pipeline operator has determined the HCAs on its pipeline, it must apply the elements of its Integrity Management Plan to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for the Integrity Management Plan at 49 CFR Part 192.911. The pipeline integrity management rule for HCAs requires inspection of the pipeline every 7 years. Transco has developed a comprehensive Integrity Management Plan for their existing facilities that meets these regulations. Transco would modify the existing Integrity Management Program, as necessary, to incorporate the proposed facilities. This program includes proper training to individuals to ensure they have the necessary information to perform their tasks and to ensure the safe operation of pipeline facilities. Transco's pipeline Integrity Management Program includes an Operator Qualification Plan that ensures all individuals who perform tasks on their pipelines and other facilities, including contractors, are qualified in accordance with 49 CFR Part 192 Subpart N.

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[30] The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline in pounds per square inch multiplied by the pipeline diameter in inches.

[31] The potential impact circle is a circle of radius equal to the potential impact radius.

Other key elements of Transco's Integrity Management Program include hydrostatic testing and use of various internal pipeline inspection tools prior to and during the proposed pipeline being placed into service. Transco would use hydrostatic testing to validate the strength of the Rockaway Delivery Lateral and identify any smaller defects before they become a threat. Before the newly installed pipeline would be placed into service, the line would be pressure-tested with water by increasing the pressure at a significantly higher level (at least 1.5 times higher) that exceeds the maximum pressure at which the pipeline would operate. This would help Transco determine if the pipeline meets the design strength requirements, and to determine if any leaks are present. In addition to hydrostatically testing their pipelines, Transco would use an inline inspection tool, called a caliper pig, designed to record conditions, such as dents, wrinkles, ovality, bend radius and angle, and occasionally indications of significant internal corrosion by making measurements of the inside surface of the pipe. Transco would run a caliper pig before the Rockaway Delivery Lateral is placed into service.

Transco uses an additional internal pipeline inspection tool, known as a "smart pig," that is capable of identifying and classifying pipe defects, including metal loss, dents, gouges, and other types of defects. The smart pig would be inserted into the pipeline and pushed by the flow of natural gas in the pipeline.

In addition to their Integrity Management Program, Transco has a Pipeline Safety Monitoring Program in place to ensure the proposed Rockaway Delivery Lateral is constructed properly. During construction of the pipeline, Transco would inspect the pipe and coating to ensure that it meets all quality control standards and specifications. Transco would require that all pipe girth welds are non-destructively tested and then verified in the field by x-ray before installation is considered complete. Once the pipeline is installed, Transco would implement the following routine monitoring measures:

- physically walking and inspecting the onshore pipeline corridor on a periodic basis;
- inspecting valve settings and observing area construction activities (generally, on a weekly basis); and
- conducting leak surveys at least once every calendar year or as required by DOT regulations.

Transco would monitor portions of its onshore and offshore pipeline systems using a supervisory control and data acquisition (SCADA) system. The SCADA system gathers data and transfers the information back to Transco's Gas Control Center alerting personnel if a leak or other malfunction within the system is detected. Transco's Gas Control Center is located in Houston, Texas.

After construction, and as required by DOT regulations, the Rockaway Delivery Lateral would be marked at line-of-sight intervals and at crossings of roads, railroads, and other key points. The markers, which are described in more detail in Section 2.6.1, would indicate the presence of the pipeline and provide a telephone number and address where a company representative could be reached in the event of an emergency or before any excavation in the area of the pipeline by a third party. Transco participates in the "Call Before You Dig" and "One Call" programs and other related pre-excavation notification organizations in all the states in which they operate.

In addition to pipeline safety standards, Transco would adhere to 49 CFR Parts 192.739 through 192.743 guidelines for inspection and monitoring at pressure limiting and regulating stations. Transco's construction of the proposed M&R facility and modifications at Compressor Stations 195, 205, and 207 would be designed, constructed, and operated to meet or exceed applicable specifications. The piping at

each facility would be manufactured in accordance with API specifications, and wall thickness would conform to PHMSA safety regulations contained in 49 CFR Part 192.

The NPS conducted a risk analysis to evaluate the safety of Transco's design for constructing, operating, and maintaining the proposed M&R facility in the hangar complex at Floyd Bennett Field (AMEC Environment and Infrastructure, Inc., 2013). The analysis concluded that the design complies with or exceeds the minimum federal safety standards at 49 CFR Part 192. However, the authors suggested several changes to further enhance the safety of design or security of the facility during operations. These preliminary recommendations are currently being evaluated by the NPS and Transco to determine whether or not they are appropriate and feasible.

Other Measures

Transco would implement various public safety measures during construction of the Rockaway Project including, but not limited to, the following:

- Traffic Controls: Transco would provide the required traffic warning signs along all road crossings, position a flagman when necessary to direct traffic when deliveries are made to and from the temporary work areas, maintain emergency vehicle access at all times, and ensure appropriate contact information is provided to local authorities prior to the start of construction.

- Public Access: Transco personnel would monitor all construction sites in areas open to the public. To ensure public safety, Transco would install safety fences and security fences, if necessary, around the construction area. In addition, Transco would commit their operations personnel to patrol both the proposed pipeline and facility site on a routine basis, and would hire a security guard to patrol after work hours and on weekends.

- Working Above Existing In-Service Pipelines (as applicable): Transco has not yet identified the specific locations of existing pipelines that may be adjacent to the proposed pipeline. Transco would locate these facilities before construction and would evaluate if construction equipment must temporarily operate over these lines and what the potential hazards would be of doing so. Transco would recommend to its construction contractors additional soil cover, matting, or other means to be implemented to protect the in-service utilities in accordance with Transco's and the utility company's specifications and public safety codes.

- Utility Crossovers (as applicable): Transco would avoid any unnecessary crossing over/under of foreign lines when possible. In areas where crossovers are unavoidable, such as the active and inactive cable crossings, Transco would review safety procedures, develop individual work plans, and work with the utility owner to produce a crossing method that satisfies both companies' policies and public safety codes.

- Welding: Transco would use company-approved and tested welders to work on the pipeline facilities. All qualified welders would be required to meet the standards of the ASME Section IX, API 1104 and CFR 49 Part 192.

4.12.2 Pipeline Accident Data

The DOT requires all operators of natural gas transmission pipelines to notify the DOT of any significant incidents and to submit a report within 20 days. Significant incidents are defined as any leaks that:

- cause a death or personal injury requiring hospitalization; or
- involve property damage of more than $50,000 in 1984 dollars. [32]

During the 20-year period from 1992 through 2011, a total of 1,197 significant incidents were reported on the more than 300,000 total miles of natural gas transmission pipelines nationwide.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 4.12.2-1 provides a distribution of the causal factors as well as the number of each incident by cause. The dominant incident causes, corrosion and pipeline material, weld, or equipment failure, comprise 47.1 percent of all significant incidents. The pipelines included in the data set in Table 4.12.2-1 vary widely in terms of age, pipe diameter, and level of corrosion control. Each of these variables influences the incident frequency that may be expected for a specific segment of pipeline. The frequency of significant incidents, for example, is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents because corrosion is a time-dependent process.

TABLE 4.12.2-1
Natural Gas Transmission Pipeline Significant Incidents by Cause (1993-2012) [a]

Cause	Number of Incidents	Percentage [b]
Corrosion	286	23.6
Excavation [c]	203	16.8
Pipeline material, weld, or equipment failure	285	23.5
Natural force damage	144	11.9
Outside forces [d]	67	5.5
Incorrect operation	32	2.6
All other causes [e]	194	16.0
Total	**1,211**	–

[a] PHMSA, 2014.
[b] Due to rounding, column does not total 100 percent.
[c] Includes third-party damage.
[d] Fire, explosion, vehicle damage, previous damage, intentional damage.
[e] Miscellaneous causes or unknown causes.

The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe. [33] Transco's LNYBL pipeline system has an impressed current cathodic protection system where a constant potential of direct current is applied on the pipeline to prevent external corrosion. Transco checks the voltage and amperage every 2 months and completes annual surveys on the system.

[32] $50,000 in 1984 dollars is approximately $110,000 as of December 2012 (CPI, Bureau of Labor Statistics, ftp://ftp.bls.gov/pub/special.requests/cpi/cpiai.txt, January 16, 2013).

[33] Cathodic protection is a technique to reduce corrosion (rust) of the natural gas pipeline that includes the use of an induced current or a sacrificial anode (like zinc) that corrodes at faster rate to reduce corrosion.

Excavations, natural forces, and outside forces are the causes in 34.2 percent of significant pipeline incidents. Table 4.12.2-2 presents information on these incidents by cause. The incidents mostly result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; and weather effects such as winds, storms, and thermal strains.

TABLE 4.12.2-2
Outside Forces Incidents by Cause (1993-2012) [a]

Cause	Number of Incidents	Percent of all Incidents [b]
Third-party excavation damage	170	14.0
Operator excavation damage	25	2.0
Unspecified equipment damage/previous damage	4	0.3
Previous damage due to excavation	4	0.3
Heavy rain/floods	70	5.7
Earth movement	38	3.1
Lightning/temperature/high winds	21	1.6
Other/unspecified natural force	15	1.1
Vehicle (not engaged with excavation)	42	3.4
Fire/explosion	8	0.6
Previous mechanical damage	5	0.4
Intentional damage	1	0.0
Other/unspecified outside force	5	0.3
Maritime equipment or vessel adrift/ maritime activity	6	0.4
Total	**414**	**--**

[a] Excavation, outside forces, and natural force damage from Table 4.12.2-1.
[b] Due to rounding, column does not equal 34.2 percent.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipeline systems contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

Transco Pipeline Incidents

Tables 4.12.2-3 and 4.12.2-4 list Transco's unintentional onshore and offshore pipeline leaks per 1,000 miles of pipeline from 2002 to 2012 involving the release of gas from a pipeline. Over an 11-year period, an average rupture rate for Gulf of Mexico natural gas pipelines was calculated to be 0.000024 incidents per mile (S.L. Ross, 2009). When applied to the proposed pipeline, these data suggest that the annual chance of a rupture of the proposed Rockaway Delivery Lateral would be very low (i.e., roughly 1 in 13,888 or a 0.0072 percent annual chance).

TABLE 4.12.2-3
Transco Unintentional Onshore Leaks per 1,000 Miles

Year	Transco	Northwest	Gulfstream	Industry
2002	0.130	0.518	0.00	0.192
2003	0.000	1.499	0.00	0.274
2004	0.458	1.285	3.03	0.280
2005	0.459	1.479	0.00	0.360
2006	0.783	2.327	0.00	0.368
2007	0.811	0.259	0.00	0.295
2008	0.339	0.258	0.00	0.313
2009	0.680	1.554	0.00	0.308
2010	0.363	0.516	0.00	0.274
2011	0.365	0.516	0.00	0.340
2012	0.249	0.000	0.00	0.295
Average	0.422	0.928	0.275	0.300

Source: PHMSA, 2014.

TABLE 4.12.2-4
Transco Unintentional Offshore Leaks per 1,000 Miles

Year	Transco	Northwest	Gulfstream	Industry
2002	0.00	NA	2.35	2.58
2003	0.00	NA	0.00	1.97
2004	1.43	NA	0.00	3.30
2005	1.78	NA	0.00	9.53
2006	1.07	NA	0.00	3.32
2007	1.43	NA	0.00	3.92
2008	2.85	NA	0.00	4.90
2009	1.59	NA	0.00	2.32
2010	1.21	NA	0.00	4.23
2011	0.63	NA	2.48	2.45
2012	0.64	NA	0.00	3.09
Average	1.15	NA	0.44	3.78

Source: PHMSA, 2014.

We received several comments regarding Transco's incident, safety, and violation history and high potential for accidents in densely populated areas. Since 2006, Transco has had a total of 20 reported incidents involving its onshore and offshore natural gas transmissions lines, none of which caused fatalities or injuries. The cause for most of the incidents related to either internal or external corrosion.

Over the 35-year period prior to 2000, there were 42 reported incidents of offshore oil and gas pipeline damage by anchors. Within the 25 years up to and including the year 2000, two of these incidents were significant. One accident involved a large fishing vessel in the Gulf of Mexico severing a pipeline in shallow water, and the other involved a gas production platform. Since 2002, Transco has had an average of 1.15 reportable offshore incidents per year, which is less than the industry average of 3.78 incidents per year.

To mitigate risk associated with the potential for damage from anchors or fishing equipment, 0.65 mile of Transco's offshore pipeline would be installed by HDD methods up to 100 feet below the seabed. For the remainder of its length, Transco's offshore pipeline would be installed with a minimum of 4 feet of cover (see Section 2.3.1).

4.12.3 Impacts on Public Safety

Transco has a Public Awareness and Damage Prevention Program where they would review, revise, and develop a new Emergency Response Plan for the proposed Rockaway Delivery Lateral. Transco would meet with local emergency services agencies on a regular basis to review and revise their plans when necessary. Transco would provide a 24-hour emergency response number to the local emergency agencies, which would be included in informational mail-outs and posted on all pipeline markers.

We received several comments from individuals who are concerned about the adequacy of firefighting capabilities, including the operability of fire hydrants, at Floyd Bennett Field where Transco is proposing to construct the M&R facility. No special fire-fighting apparatus is required to fight a high-pressure natural gas fire along the pipeline itself or at the M&R facility. The most effective and immediate way to address a high-pressure gas pipeline rupture is to shut off the gas source. To do so, Transco uses both automatic rupture-detection and remote-controlled shut-off valves. Automatic valves close automatically upon sensing a significant pressure drop, and remote-controlled valves may be closed within 90 seconds of a shut-off command from Transco's Gas Control Center. In the event of a release, both automatic and remote-controlled valves may also be closed manually by emergency or operations personnel. As a backup, both Transco's and National Grid's Gas Control Centers would have remote access capability to shut in the pipeline. Transco would also install a remote shut down valve within the proposed M&R facility.

Transco would maintain hand-held dry chemical fire extinguishers for small fires and a sprinkler system at the M&R facility. With regard to the operability of fire hydrants at Floyd Bennett Field, Transco is working with the NPS and New York City Fire Department to evaluate the firefighting system at Floyd Bennett Field for code compliance (e.g., hydrant spacing and flow). Transco states that it would make any necessary repairs or improvements to the system in the vicinity of the M&R facility to bring it up to code prior to commencing operations.

Table 4.12.3-1 presents the average annual injuries and fatalities that occurred on natural gas transmission lines between 2008 and 2012. The data have been separated into employees and nonemployees, to better identify a fatality rate experienced by the general public. Fatalities among the public averaged two per year over the 20-year period from 1993-2012 (PHMSA, 2014).

TABLE 4.12.3-1
Annual Average Fatalities – Natural Gas Transmission Pipelines

	Injuries		Fatalities	
Year	Employees	Public	Employees	Public
2008	3	2	0	0
2009	4	7	0	0
2010 [a]	10	51	2	8
2011	1	0	0	0
2012	3	4	0	0

[a] All of the public injuries and fatalities in 2010 were due to the Pacific Gas and Electric pipeline rupture and fire in San Bruno, California on September 9, 2010.

The majority of fatalities from pipelines involve local distribution pipelines. These are natural gas pipelines that are not regulated by the FERC and that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes, often made of plastic or cast iron rather than welded steel, and tend to be older pipelines that are more susceptible to damage. In addition, distribution systems do not have large rights-of-way and pipeline markers common to the FERC-regulated natural gas transmission pipelines.

The nationwide totals of accidental fatalities from various manmade and natural hazards are listed in Table 4.12.3-2 to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. We received several comments from individuals regarding the safety of pipeline operations relative to automotive accidents, which are included in the table. Direct comparisons between the different accident categories listed in the table should be made cautiously because individual exposures to hazards are not uniform among all categories. The data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to the other categories. For example, the fatality rate for incidents involving natural gas pipelines is more than 25 times lower than the rate from natural hazards such as lightning, tornados, floods, and earthquakes.

TABLE 4.12.3-2
Nationwide Accidental Deaths [a]

Type of Accident	Annual Number of Deaths
All accidents	117,809
Motor Vehicle	45,343
Poisoning	23,618
Falls	19,656
Injury at work	5,113
Drowning	3,582
Fire, smoke inhalation, burns	3,197
Floods [b]	93
Lightning [b]	57
Tornado [b]	57
Natural gas distribution lines [c]	14
Natural gas transmission pipelines [c]	2

[a] U.S. Census, 2010.
[b] NOAA, National Weather Service, 2012.
[c] PHMSA, 2014.

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1993 to 2012, there were an average of 61 significant incidents and two fatalities per year (PHMSA, 2014). The number of significant incidents over the more than 300,000 miles of natural gas transmission lines indicates the risk is low for an incident at any given location. The operation of the Rockaway Project would represent a slight increase in risk to the nearby public.

4.12.4 Additional Safety and Security Issues

Safety and security concerns have changed the way pipeline operators as well as regulators consider terrorism, both in approving new projects and in operating existing facilities. The Department of Homeland Security (DHS) is tasked with the mission of coordinating the efforts of all executive departments and agencies to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States. Among its responsibilities, the DHS oversees the Homeland Infrastructure Threat and Risk Analysis Center, which analyzes and implements the National Critical Infrastructure Prioritization Program that identifies and lists Tier 1 and Tier 2 assets. The Tier 1 and Tier 2 lists are key components of infrastructure protection programs and are used to prioritize infrastructure protection, response, and recovery activities. The Commission, in cooperation with other federal agencies, industry trade groups, and interstate natural gas companies, is working to improve pipeline security practices, strengthen communications within the industry, and extend public outreach in an ongoing effort to secure pipeline infrastructure. As identified in the OPS Circular Guide Document, Transco is in full compliance with all existing regulations and guidelines from the DHS's Transportation Security Administration (TSA). The TSA has audited Transco twice in the past 3 years to ensure Transco is in compliance with all applicable regulations. Transco is currently in compliance with the following guidelines issued by PHMSA and adopted by the DHS, Surface Pipeline Security Branch:

- Security Practices – Natural Gas Industry Transmission; and
- Distribution and Pipeline Security Contingency Planning Guidance.

In addition to complying with the TSA, Transco has participated in the following programs in order to enhance the security of its pipeline system:

- Transco attended the "Electric and Gas Security Working Group" facilitated by the New Jersey Board of Public Utilities.

- Transco participated in the New Jersey Board of Public Utilities, Energy Assurance Plan, Gas Tabletop Exercise "Operation Keep Warm" on May 22, 2012. The drill focused on interruption of interstate natural gas supply, operations, and emergency procedures.

- Transco Operations Management participated in the Incident Command System Training (Series 100, 200, and 300).

- Transco Operations Management staff attended the New York City Police Department Ports Awareness Response and Training.

- Transco is in compliance with TSA security guidelines and has been audited by TSA to validate such compliance. Further, Transco assisted TSA in developing the referenced guidelines. Transco routinely participates in recurring monthly intelligence briefings, as well as ad hoc briefings on specific issues with DHS, TSA, and other federal agencies.

- Transco's security representatives have government clearances and participate in classified briefings conducted by the referenced agencies.

- Transco routinely participates in DHS/TSA Pipeline Security Division initiatives, including attending TSA's annual International Security Forum.

- Transco participates in multiple industry association security committees (e.g., Interstate Natural Gas Association of America, the American Gas Association, and API) for the purpose of enhancing security for the pipeline industry generally and Transco specifically.

- Transco is a member of the Oil and Natural Gas Pipeline Working Group Sector Coordinating Council (SCC). SCCs exist for each type of critical infrastructure and are intended to promote collaboration and partnering by the DHS with critical infrastructures (including pipelines) owned and operated by the private sector.

- Transco participates in a number of other forums and associations in order to promote security leadership with the company and the industry. Such organizations include the Energy Security Council; the International Security Management Association; the Domestic Security Alliance Council, a Federal Bureau of Investigation-sponsored association; the Oversees Security Advisory Council, a U.S. Department of State-sponsored association; and the American Society for Industrial Security.

The Commission is faced with a dilemma in how much information can be offered to the public while still providing a significant level of protection to the facility. Consequently, energy facility design plans and location information have been removed from the FERC's website to ensure sensitive information filed under Critical Energy Infrastructure Information is not readily available (RM02-4-000 and PL02-1-000 issued February 20, 2003).

The likelihood of future acts of terrorism or sabotage occurring at the proposed facilities, or at any of the myriad natural gas pipeline or energy facilities throughout the United States, is unpredictable given the disparate motives and abilities of terrorist groups. Although being sensitive to the history of incidents in the Rockaway Project area, the continuing need to construct facilities to support the future natural gas pipeline infrastructure is not diminished from the threat of any such future acts.

4.13 CUMULATIVE IMPACTS

Cumulative impacts represent the incremental effects of a proposed action when added to other past, present, or reasonably foreseeable future actions, regardless of what agency, organization, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over a given period. Analyses of cumulative impacts can be used to modify actions if impacts are avoidable; determine if additional or more appropriate mitigation is warranted; or identify effective monitoring for any impacts of concern.

We prepared the analysis below to identify and describe cumulative impacts that would potentially result from implementation of the Rockaway Project and the proposed modifications at Compressor Station 195 for the Northeast Connector Project. The analysis uses an approach consistent with the methodology set forth in guidance documents from the CEQ (1997b) and EPA (2005). Under these guidelines, inclusion of other potential future actions is based on identifying commonalities between the impacts that would result from the Projects and the impacts likely to be associated with other potential projects.

In order to avoid unnecessary discussion of insignificant impacts and projects, and to adequately address and accomplish the purposes of this analysis, the cumulative impacts assessment for the Projects was conducted using the following guidelines:

- Projects and activities included in this analysis are generally those of comparable magnitude and nature of impact, and are located within the same municipalities or townships that would be affected by the Projects (i.e., onshore projects in or near the GNRA, offshore projects in close proximity of the Rockaway Inlet and Jamaica Bay, and projects near Transco's existing aboveground facilities). The analysis also includes the proposed non-jurisdictional facilities associated with the Projects.

- Another project must impact the same resource category as the Projects for there to be a cumulative impact on that resource category. For the most part, this is possible when other projects are located in the same regions or areas as the Projects. The effects of more distant projects generally are not assessed because their impacts are or would be localized and do not contribute significantly to impacts in the Project areas. An exception is air quality, which can have far-field effects. Therefore, air quality was considered on a regional basis.

- The future timeframe that another planned or proposed project could result in a cumulative impact relative to the proposed Projects depends in part on whether the impacts are short term, long term, or permanent. Most of the impacts associated with the Projects are short-term effects that would occur during the period of construction.

- The scope of the cumulative impact assessment depends on the availability of information about other projects. For this assessment, other projects were identified from information provided by Transco; field reconnaissance; internet research; and communications with federal, state, and local agencies. The impacts were quantified to the extent practicable where cumulative impacts were potentially indicated. In most cases, the potential impacts could be described qualitatively but not quantitatively. This is particularly true for projects that are in the planning stage or are contingent upon economic conditions, availability of financing, or the issuance of permits.

Current, proposed, or reasonably foreseeable future projects or activities that may cumulatively impact resources that would be affected by construction and operation of the Projects are identified in

Tables 4.13-1 and 4.13-2. These include non-jurisdictional facilities associated with the Projects, other energy projects, dredging and beach nourishment projects, post-Hurricane Sandy recovery projects, and private projects. Some of these projects do not fit all of the guidelines described above, but we considered them large enough to mention in the analysis.

We received numerous comments during scoping for the Projects, in comments accompanying requests to intervene, and on the draft EIS, about cumulative impacts associated with development of natural gas reserves (including hydraulic fracturing) in the Marcellus Shale. Activities associated with the Projects would occur outside of the Marcellus Shale region. As a result, the local resources that may be affected by Marcellus Shale development would not be affected by the Projects, and local resources affected by the Projects would not be affected by development in the Marcellus Shale. Further, the development of the Marcellus Shale production field is not dependent on the Projects, nor are the Projects dependent on the development of Marcellus Shale gas to achieve their stated goals. Even without these two determinations, the future development of the Marcellus Shale is not predictable or "reasonably foreseeable," which makes it impossible to establish a causal relationship between the Projects and the development of gas from the Marcellus Shale.

We also note that a majority of the natural gas to be provided by the Projects to National Grid (about 85 percent by volume) is replacement gas, which currently is provided to National Grid via the existing delivery point in Long Beach, New York. A small portion (about 15 percent by volume) of the natural gas to be provided by the Projects to National Grid is incremental (i.e., additional), which could originate at any number of points along the interconnected interstate natural gas pipeline grid. For all these reasons, the effects of activities in the Marcellus Shale region are beyond the scope of the cumulative impacts analysis described below.

Non-Jurisdictional Facilities

National Grid's BQI Project consists of system upgrades to enhance reliability of service to customers by boosting delivery pressures and eliminating an existing dead-end feed on the Rockaway Peninsula in Queens County, New York. The BQI Project will provide a new delivery point that offers a long-term solution to meet the supply needs of National Grid's system by delivering natural gas from Queens to the Brooklyn area, where supplies are currently needed. The BQI Project is being constructed in two phases. Construction of Phase I was completed in November 2013. Phase II is expected to be built in 2014.

Phase I of the BQI Project consisted of the installation of two parallel 12- and 26-inch-diameter natural gas pipelines, each estimated to be approximately 8,300 feet long, under Flatbush Avenue. The pipelines extend from an existing 8-inch-diameter distribution pipeline in the vicinity of the southernmost airplane hangar in Floyd Bennett Field, to an existing 8-inch-diameter pipeline at Beach 169th Street south of Beach Channel Drive on the Rockaway Peninsula in Queens County. Phase II of the BQI Project will entail the installation of approximately 12,000 feet of 30-inch-diameter natural gas transmission pipeline from National Grid's existing 30-inch-diameter, 350 psig transmission main at the intersection of Hendrickson Street and Avenue U, to the 26-inch-diameter Phase I pipeline at a point in the vicinity of the southernmost airplane hangar at Floyd Bennett Field along Flatbush Avenue in Brooklyn County, New York.

PECO plans to rebuild a portion of its existing 4 kilovolt (kV) electric transmission system to a three-phase 345 kV system to provide power to Compressor Station 195 in York County, Pennsylvania. PECO plans to reuse some of the existing power poles within the system, but it is estimated that up to 80 percent would be replaced with new ones, possibly with new spacing between the poles. The rebuild would occur within the existing right-of-way for the electric transmission system.

TABLE 4.13-1
Existing or Proposed Projects that Could Cumulatively Impact Environmental Resources in the Region of Influence for the Rockaway Project

Project	Location	Project Description	Anticipated Construction Date/Project Status
National Grid's BQI Project	Rockaway Inlet and Floyd Bennett Field	Phase I consisted of the installation of parallel 12- and 26-inch-diameter natural gas pipelines beneath the Rockaway Peninsula and Floyd Bennett Field. The HDD method was be used to install the pipeline beneath Rockaway Inlet. Phase II consists of the installation of a 30-inch-diameter natural gas pipeline between the intersection of Avenue U and Hendrickson Place and Floyd Bennett Field. The HDD method will be used to install the pipeline under the Belt Parkway.	Construction of Phase I was completed in November 2013; Phase II is scheduled to be built in 2014
Liberty Natural Gas, LLC, Port Ambrose LNG Project	19 miles offshore of Jones Beach	Proposal to construct and operate two STL buoy systems to receive and transfer natural gas from LNGRVs and two subsea lateral pipelines to deliver natural gas to Transco's LNYBL.	Application filed with MARAD on September 12, 2012; MARAD instituted a 90 delay in federal review of the application on October 21, 2013; proposed to be in-service no sooner than late 2015
NYPA, LIPA, and Con Edison, Long Island-New York City Offshore Wind Project [a]	Atlantic Ocean, approximately 13 to 17 nautical miles off the Rockaway Peninsula	Proposal to install offshore wind turbines capable of generating up to 700 megawatts of power.	Feasibility stage; originally scheduled to be in service by 2015, but may not be in service before 2017
U.S. Marine Corps Wind Energy Program Site [b]	Marine Forces Reserve Center at the southern end of Floyd Bennett Field	Installation of up to three 50-kilowatt wind turbines.	Scheduled to be completed in fiscal year 2013
U.S. Marine Corps [b]	Marine Forces Reserve Center at the southern end of Floyd Bennett Field	Construction of a cellular tower and a vehicle maintenance facility.	Unknown
USACE Maintenance Dredging of Jamaica Bay Federal Navigation Channel at Rockaway Inlet [c]	Jamaica Bay Federal Channel	Dredging project to deepen the navigation channel.	Completed in 2012
USACE Emergency Dredging and Beach Nourishment [d, e]	Jamaica Bay Inlet (dredge) and Rockaway shoreline (nourishment)	Proposal to perform emergency dredging of East Rockaway Inlet to Rockaway Inlet and beach nourishment at Rockaway Beach.	Currently under construction; expected to be complete in 2014
USACE Jacob Riis Park Site Management and Debris Processing [e, f]	Jacob Riis Park	Proposal to remove approximately 150,000 cubic yards of debris associated with Hurricane Sandy from Jacob Riis Park.	Completed in 2013
City of New York and NPS, Jamaica Bay Science and Resilience Center [g]	Floyd Bennett Field	Expression of interest in constructing a new research facility, possibly at Floyd Bennett Field, to study ecosystems in Jamaica Bay and surrounding areas.	Unknown

TABLE 4.13-1 (cont'd)
Existing or Proposed Projects that Could Cumulatively Impact Environmental Resources in the Region of Influence for the Rockaway Project

Project	Location	Project Description	Anticipated Construction Date/Project Status
Residential and Commercial Building Projects	Various	Transco identified several commercial and residential building projects, ranging from single-family dwellings to a large commercial auto mall, some of which could be built during the same timeframe as the Rockaway Project. Additionally, it is reasonable to expect that considerable construction will be undertaken on the Rockaway Peninsula to address damage caused by Hurricane Sandy.	It is assumed that some commercial and residential construction will occur throughout 2013, 2014, and beyond

Sources:
[a] Long Island-New York City Offshore Wind Project, 2013.
[b] U.S. Marine Corps, 2013.
[c] USACE, 2012c.
[d] Federal Business Opportunities, 2013a.
[e] USACE, 2013a.
[f] Federal Business Opportunities, 2013b.
[g] USACE, 2013c.
[h] City of New York and NPS, 2012.

TABLE 4.13-2
Existing or Proposed Projects that Could Cumulatively Impact Environmental Resources in the Regions of Influence for the Northeast Connector Projects

Project	Location	Project Description	Anticipated Construction Date/Project Status
PECO, power line project	York County, Pennsylvania	Modification of the existing electric transmission system and power lines servicing Compressor Station 195.	2014
Transco, Delta Lateral Project	York County, Pennsylvania	Construction of 3.4 miles of pipeline lateral and modifications at Compressor Station 195.	Completed in September 2010
Transco, maintenance project	York County, Pennsylvania	Minor modification of facilities at Compressor Station 195.	Completed in October 2011
Transco, maintenance project	York County, Pennsylvania	Minor maintenance at Compressor Station 195.	Undetermined
Transco, Leidy Southeast Project	Pennsylvania, New Jersey, Maryland, Virginia, and North Carolina	Construction of 30.1 miles of 42-inch-diameter pipeline in four loop segments; modifications at 11 existing compressor stations (including Compressor Station 205); and modifications of other aboveground facilities (such as mainline valves and M&R facilities).	October 2014 through December 2015
Transco, Virginia Southside Expansion Project	Virginia, Maryland, Pennsylvania, and New Jersey	Construction of 98 miles of 24-inch-diameter pipeline; one new compressor station (Compressor Station 166); one new meter station; seven valve sites; and minor modifications at existing aboveground facilities (including Compressor Station 205).	Second quarter of 2014

4.13.1 Geology and Soils

The facilities associated with the Rockaway Project and the proposed modifications at Compressor Station 195 for the Northeast Connector Project are expected to have temporary and minor impacts on near-surface geology and soils. Implementation of Transco's Plan (Appendix D) for the Rockaway Project and the FERC Plan for Compressor Station 195 would prevent or minimize any indirect impacts. Because the direct effects would be highly localized and primarily limited to the period of construction, cumulative impacts on geology and soils would occur if other projects are constructed at the same time and place as the proposed facilities.

The construction of some of the projects listed in Tables 4.13-1 and 4.13-2 would coincide with construction of the proposed Projects. These include the BQI Project, the power line upgrade associated with Compressor Station 195, and the beach nourishment project at Rockaway Beach. Projects that require significant excavation or grading would have direct impacts on near-surface geology and soils, but like the Projects, the duration and effect of these actions would be minimized by the implementation of erosion controls and restoration measures. Consequently, the cumulative effect of the Projects on geological resources and soils would be temporary and minor.

Several of the projects listed in Table 4.13-1, like the proposed Rockaway Project, would impact offshore sediments within the New York Bight. Construction of the Port Ambrose LNG Project, for example, would impact about 309 acres of seabed. Because the impacts on sediments associated with the Rockaway Project and these other projects would be localized and short term, we do not anticipate any significant cumulative impacts on offshore sediments as a result of the Rockaway Project.

4.13.2 Groundwater

Groundwater resources could be vulnerable to contamination caused by inadvertent surface spills of hazardous materials used during construction of the Projects. Implementation of the measures identified in Transco's SPCC Plan (Appendix F) and Construction Spill Plans (Appendix G) would minimize the potential for groundwater impacts associated with an inadvertent spill of these materials. All of the major projects listed in Tables 4.13-1 and 4.13-2, like the Projects, would likely be required to obtain water use and discharge permits, and would implement appropriate measures as required by federal and state agencies. National Grid, for example, would implement a Stormwater Pollution Prevention Plan during installation of the Phase II 30-inch-diameter pipeline on the west side of Flatbush Avenue to protect and prevent impacts on Four Sparrow Marsh; this is a NYCDPR and Recreation Forever Wild Nature Preserve located east of Flatbush Avenue and north of the Belt Parkway. For all these reasons, we do not anticipate any cumulative impacts on groundwater as a result of the Projects.

4.13.3 Surface Water

The Atlantic Ocean would be affected during construction of the offshore portion of the Rockaway Delivery Lateral. Impacts on ocean waters would result from the excavation of seabed sediments resulting in a temporary increase in turbidity and TSS as well as sedimentation on the seafloor. Several of the projects listed in Table 4.13-1, such as the Port Ambrose LNG Project, the NYPA/LIPA/Con Edison offshore wind project, and dredging activities in Jamaica Bay and the Rockaway Inlet, would result in similar impacts on water quality in the New York Bight. No surface waters would be affected as a result of construction activities associated with the BQI Project. The proposed pipelines for Phase I of the BQI Project were installed beneath the waters and seabed of Rockaway Inlet/Jamaica Bay via the HDD method, and no construction activity occurred within the waterbody itself. No surface waters would be affected by construction activities at Compressor Station 195 or by the upgrade of the power line servicing the site.

Because the impacts on the Atlantic Ocean associated with the Rockaway Project would be localized and short term, and comply with state water quality requirements, we do not anticipate any cumulative impacts on water quality. Potential cumulative impacts on fisheries and aquatic resources are discussed in Section 4.13.7 below.

4.13.4 Wetlands

The Rockaway Project would cross one wetland along the southern shore of the Rockaway Peninsula, but Transco proposes to cross under this area using the HDD construction method. The use of this method would avoid any temporary and permanent impacts on the wetland during construction of the pipeline. Phase I of the BQI Project crossed under wetlands along the shoreline adjacent to Jamaica Bay, but these areas were avoided by the use of the HDD method to install the pipelines. No wetlands would be affected by construction activities at Compressor Station 195 for the Northeast Connector Project. Road ditches along Bryansville Road may be affected by the replacement of power poles associated with PECO's electric transmission system upgrade, but in previously disturbed areas. No wetlands would be affected by the installation of poles within the fenced boundaries of Compressor Station 195. Therefore, the Projects would not contribute to cumulative impacts on wetlands.

4.13.5 Vegetation

The effects of the Projects on terrestrial vegetation would be limited to the temporary disturbance of maintained areas at the HDD entry workspace on the Rockaway Peninsula and at Compressor Station 195 (including the removal of trees within a hedgerow), and by the clearing of a small amount of herbaceous vegetation growing through the broken pavement surrounding the M&R facility site. Several of the projects listed in Tables 4.13-1 and 4-13.2 would also impact vegetation. Some of these projects, like the BQI Project and the power line upgrade at Compressor Station 195, would have or have already had temporary impacts on vegetation during construction. Phase I of the BQI Project, for example, resulted in the temporary disturbance of maintained areas at the HDD entry workspace on the Rockaway Peninsula and the removal of nine trees along the pipeline route. Other projects, such as the construction of new housing, may have more permanent impacts.

Transco would implement the measures outlined in its Plan (Appendix D) for the Rockaway Project and in the FERC Plan for the Northeast Connector Project to ensure the successful revegetation of disturbed areas, where applicable. As a result, the overall impact of the Projects would be temporary and minor. For the BQI Project, National Grid agreed to limit the removal of or damage to vegetation, protect the roots of trees planted along streets, replace the nine trees that were removed during construction of Phase I, and ensure the restoration of any open spaces or parkland disturbed as a result of the project. For these reasons, we do not expect the Projects to contribute significantly to cumulative impacts on onshore vegetation.

Offshore, the Rockaway Project area is largely un-vegetated, although it is possible that small patches of turf algae growing on manmade structures, such as concrete and pipe fragments, could be affected. Other offshore projects, such as the Port Ambrose LNG Project, the NYPA/LIPA/Con Edison offshore wind project, and dredging activities in Jamaica Bay and the Rockaway Inlet could affect offshore vegetation. Overall, impacts are expected to be minor, temporary, and/or localized. Therefore, we do not expect the Projects to contribute significantly to cumulative impacts on offshore vegetation.

4.13.6 Wildlife and Habitats

Cumulative effects on wildlife and habitats could occur where projects are constructed in the same general timeframe and proximity as the Projects or result in the permanent or long-term loss of habitat. While several of the projects listed in Table 4.13-1, including the BQI Project, could impact

terrestrial wildlife, the Rockaway Project would have a minimal temporary impact on terrestrial wildlife habitat. The onshore areas that would be affected by the Rockaway Project have marginal value for nesting birds and other wildlife. Construction noise could potentially disturb foraging and loafing birds along the shoreline, but noise associated with nearshore activities like the offshore HDD are likely to be drowned out by the ambient noise of the ocean. Additionally, we note that wildlife species occurring in the Rockaway Project area are urban-adapted and tolerant of disturbance, and therefore are unlikely to be adversely affected by construction activities or noise.

For the Northeast Connector Project, the planned construction activities at Compressor Station 195 would affect developed/maintained areas and trees within a hedgerow. Upgrade of the existing power line servicing the compressor station similarly would affect developed/maintained areas, both within the station site and along Bryansville Road. These areas, like the Rockaway Project areas in Queens and Brooklyn, provide marginal habitat for wildlife species.

Construction of many of the projects listed in Tables 4.13-1 and 4.13-2 would have greater impacts on terrestrial habitats than the Projects proposed by Transco, but these other projects have varying construction schedules and would take place over relatively large geographic areas. During construction of the BQI Project, silt fence was/would be installed to prevent the passage of wildlife into construction areas. Any impacts associated with these projects would likely be short term and temporary. For all these reasons, we do not expect the Projects to contribute significantly to cumulative impacts on onshore wildlife and habitats.

Similar to the Rockaway Project, several of the projects listed in Table 4.13-1, such as the Port Ambrose LNG Project, the NYPA/LIPA/Con Edison offshore wind project, and the dredging activities in Jamaica Bay and the Rockaway Inlet, would impact offshore wildlife and habitats. Offshore impacts would include alteration of wildlife habitats, displacement of wildlife due to noise and turbidity, and other secondary effects, such as increased vulnerability to predation. Cumulative effects would be greatest where the other projects are constructed within the same timeframe and areas as the Rockaway Project. As noted in Sections 4.5 and 4.6, Transco would implement a number of measures during construction, such as turbidity monitoring and soft-start procedures for pile driving, to minimize impacts on offshore wildlife and habitats. These measures, and the additional mitigation likely to be imposed by NOAA Fisheries and other agencies if the Rockaway Project is approved, would minimize impacts on marine wildlife.

The dredging that is underway in Jamaica Bay/Rockaway Inlet could occur at the same time as the Rockaway Project, but it would be limited to maintained navigation channels or other disturbed areas that do not generally support significant habitat for wildlife species. If constructed, the Port Ambrose LNG Project and NYPA/LIPA/Con Edison offshore wind project would occur after the proposed Rockaway Project is scheduled to be completed. For these reasons, we do not believe that the Rockaway Project would contribute significantly to cumulative impacts on offshore wildlife and habitats.

4.13.7 Fisheries and Aquatic Resources

The Rockaway Project would impact aquatic resources. Benthic organisms lying within the area to be trenched or dredged would be harmed or killed. Additional losses of benthic organisms are expected due to the deposition of suspended sediments on the seafloor. Turbidity resulting from resuspension of sediments from offshore construction could reduce light penetration and photosynthetic oxygen production and could clog fish gills. Resuspension of deposited organic material and inorganic sediments could cause an increase in biological and chemical use of oxygen, potentially resulting in a decrease of dissolved oxygen concentrations in the affected area. Lower dissolved oxygen concentrations could cause temporary displacement of mobile organisms, such as fish.

Construction of the Rockaway Delivery Lateral at the same time as other projects in the ocean off the Rockaway Peninsula could result in cumulative impacts on aquatic resources and/or EFH. In the larger context of the New York Bight area, which encompasses about 31,276 square miles, the geographic extent and duration of aquatic disturbances caused by construction of the Rockaway Delivery Lateral would be minimal.

The cumulative impact of other projects on fisheries and aquatic organisms is expected to be relatively small. For example, the BQI Project used the HDD construction method to cross the Rockaway Inlet/Jamaica Bay to avoid adverse impacts on aquatic resources. With the exception of the beach nourishment project at Rockaway Beach, the other projects that would involve direct offshore impacts in the New York Bight are located many miles from the proposed Rockaway Delivery Lateral and would not likely occur during the same construction timeframe as the Rockaway Project. Additionally, all of the offshore projects, like Transco's, would be required to obtain permits from the USACE or the NYSDEC, and consult with the EPA, FWS, and NOAA Fisheries. Consequently, we expect that the cumulative effect on aquatic resources as a result of the Rockaway Project would be minor.

4.13.8 Special Status Species

The species discussed in Section 4.7 could be affected by construction and operation of other projects if they occur within the same areas and habitats as the proposed Projects. The onshore portions of the projects listed in Table 4.13-1 would likely have little impact on special status species given the urban environment of the New York metropolitan area. The EAS for the BQI Project identified two areas as potentially containing suitable habitat for listed plant species in the vicinity of the construction area, and noted that several rare, special concern, threatened, and endangered species could be present in nearby areas such as the Jamaica Bay Wildlife Refuge. No federally listed or state-listed plant species were identified during field surveys of the BQI pipeline route, and the EAS concluded that no critical habitat areas for federally listed or state-listed wildlife would be disturbed and no foraging activities would be impeded. For the Northeast Connector Project, and the associated power line upgrade, construction activities are not expected to adversely affect special status species. For these reasons, we do not believe that the Projects would contribute significantly to cumulative impacts on special status terrestrial species.

There is a greater potential for cumulative impacts on special status species from the offshore projects in the New York Bight, such the Port Ambrose LNG Project and the NYPA/LIPA/Con Edison offshore wind farm project. The sponsors of these projects would be required to consult with the appropriate federal, state, and local agencies to identify special status species in the area of their projects; evaluate the potential impacts of their projects on these species; and implement measures to avoid, minimize, or mitigate impacts on these species and their habitats. Because protection of threatened, endangered, and other special status species is part of federal and state permitting processes, we would expect that cumulative impacts on such species would be reduced or eliminated through conservation and mitigation measures identified during the relevant permitting processes. Therefore, we believe that the Rockaway Project would have no more than minor cumulative impacts on special status marine species.

4.13.9 Land Use Resources

With the exception of the M&R facility and permanent pipeline right-of-way, the Rockaway Project would have temporary impacts on land use and land cover because all of the land affected would be allowed to revert to former uses. No active maintenance of the permanent right-of-way for the onshore portion of the Rockaway Project would occur, but permanent structures would not be permitted in the future over the pipeline on Jacob Riis Park or at the tie-ins to the National Grid pipelines on TBTA property and at Floyd Bennett Field.

Other projects that have occurred or are occurring on the GNRA include debris removal at Jacob Riis Park and beach nourishment along Rockaway Beach. The debris removal project was completed in 2013, but the beach nourishment project could overlap with construction of the Rockaway Delivery Lateral in 2014. Transco's plan to use the HDD method to install the pipeline beneath the shoreline at Rockaway Beach would avoid impacts on land uses in this area and avoid conflicts with the beach nourishment project. The beach nourishment project would improve surface conditions on the beach. For these reasons, we conclude that the Rockaway Project would have no significant impact on current land uses or land cover in the GNRA.

Transco is requesting a 50-foot-wide permanent right-of-way for the Rockaway Delivery Lateral across Jacob Riis Park and the offshore area within the boundaries of the GNRA. No operational activities would occur within this right-of-way because the pipeline would be buried as much as 100 feet below the ground surface. As such, no alterations would be made to the land cover, and there would be no restrictions on current uses of Jacob Riis Park along the right-of-way. The debris removal project at Jacob Riis Park and the beach nourishment project are not expected to affect land uses in the park. Therefore, we conclude that the Rockaway Project would have no significant impact on current land cover or land uses within Jacob Riis Park.

Transco proposes to construct the M&R facility within the hangar complex (i.e., within Hangars 1 and 2) at Floyd Bennett Field. The exterior of the hangars would be rehabilitated as part of the Rockaway Project. Because construction of the BQI Project along Flatbush Avenue during Phase II would be underway at the same time as rehabilitation of the hangars, users of the GNRA could experience temporary cumulative impacts associated with noise, vibration, and increased traffic congestion from both projects, but these impacts would be intermittent, temporary, and in the case of noise, highly localized. The Rockaway Project would not affect any existing uses of the hangars because access to the complex has been restricted by the NPS due to safety concerns.

With the exception of a small portion of land (<0.3 acre) within Marine Park, the BQI Project facilities have been/would be located entirely beneath the Flatbush Avenue right-of-way and TBTA property, including the Rockaway Inlet. Locating the pipelines beneath the Flatbush Avenue right-of-way and TBTA property eliminates the need to alter or otherwise disturb existing land uses during construction and operation of the pipelines. National Grid used the HDD method to install the Phase I pipelines beneath the Rockaway Inlet to avoid impacts on existing uses of the waterway during construction of these facilities.

Construction activities at Compressor Station 195 for the Northeast Connector Project would occur on lands owned by Transco, which are and would continue to be used for natural gas transmission. Consequently, these activities would have no effect on existing land uses. The associated power line upgrade would occur within existing PECO right-of-way and the fenced boundary of Compressor Station 195. There would be no impacts on land uses in areas adjacent to the PECO right-of-way outside the boundaries of the compressor station except during the brief period of construction.

For all these reasons, we do not believe that the Rockaway Project would contribute significantly to cumulative impacts on land uses.

4.13.10 Visual Resources

The visual character of the existing landscape is defined by historic and current land uses such as recreation and development. The visual qualities of the landscape are further influenced by existing linear installations, such as highways, railroads, pipelines, and electrical transmission and distribution lines. Relative to the Rockaway Project, the projects listed in Table 4.13-1 could contribute to cumulative visual impacts if they alter the existing landscape and significantly change land cover. Most of these projects,

like the proposed Rockaway Project, would not change the character of the onshore landscape. The BQI Project, for example, has been/would be installed underground mostly along existing transportation rights-of-way and has not/would not affect visual resources. Additionally, construction of the M&R facility would improve the visual appearance of the hangars because rehabilitation of the hangar complex is part of the Rockaway Project. The NYPA/LIPA/Con Edison wind farm and Port Ambrose LNG Project would be located 13 to 19 nautical miles offshore, which would minimize their visual disturbance. Therefore, we do not believe that cumulative visual impacts would result from the Rockaway Project.

As previously indicated, construction activities at Compressor Station 195 would occur on lands owned by Transco that are used for natural gas transmission. The proposed modifications at this site would affect existing infrastructure or would be consistent in character with the existing facilities on the site. Views to the site would continue to be obscured by an existing hedgerow that surrounds the periphery of the site. The proposed upgrade to the power line servicing the site would occur within existing PECO right-of-way and the fenced boundary of the compressor station site. Therefore, we do not believe that cumulative visual impacts would result from the proposed modifications at Compressor Station 195.

4.13.11 Socioeconomics

Present and reasonably foreseeable future projects and activities could cumulatively impact socioeconomic conditions in the Project areas. As described below, employment, housing, infrastructure, and public services could experience both beneficial and detrimental effects. There would also be some impacts on transportation and traffic.

Economy and Employment

No new permanent employees would be hired for the Projects; therefore, the Projects would not contribute directly to an increase in permanent employment. The other projects listed in Tables 4.13-1 and 4.13-2 could have cumulative effects on temporary employment if more than one project is built at the same time.

For the Rockaway Project, Transco estimates that the offshore construction would employ approximately 130 workers, of whom 110 workers are expected to be local hires. These local hires would include vessel operators, welders, pipe fitters, and lay-barge support staff. The onshore construction, including pipeline construction and hangar complex rehabilitation for the M&R facility, would employ approximately 45 workers, of whom 40 workers are expected to be local hires. These hires would consist of plumbers, electricians, roofers, heavy equipment operators, masons, and asbestos abatement personnel. For the Northeast Connector Project, Transco estimates that 50 workers, including 20 local hires, would be required for construction activities at Compressor Station 195, and 5 workers each (non-local) would be required for the proposed uprates at Compressor Stations 205 and 207. The size of the workforces required to construct the BQI Project and the electric transmission upgrade at Compressor Station 195 are unknown.

As discussed in Section 4.9.1, the counties affected by the Projects have civilian labor forces ranging from hundreds of thousands to millions and unemployment rates (based on current data from the U.S. Bureau of Labor Statistics) ranging from 5.3 to 8.7 percent. This suggests that the local labor forces could meet much of the employment needs required for construction of the Projects, as well as the other projects listed in Tables 4.13-1 and 4.13-2, although it is unknown whether a sufficient number of local unemployed persons have the necessary skills to work on these projects. Therefore, if any projects are built at the same time, the demand for workers could exceed the local supply of appropriately skilled labor and require additional non-local workers.

In addition to local employment, the Projects would provide an increase in revenue for the affected counties and other benefits to local economies through the payment of payroll tax, sales tax, property tax, and/or other taxes and fees. The payroll for the Rockaway Project would be approximately $3.25 million to $4.87 million during the construction phases, with total direct spending on goods, services, and other consumables expected to range from $2.65 million to $3.92 million. Annual property taxes attributable to the Rockaway Project are anticipated to be approximately $5.3 million. For the Northeast Connector Project, Transco estimates approximately $120,000 in local sales tax as a result of material purchases and about $1.1 million in direct local spending by workers. A net increase in payroll and tax revenues is likely to result from the other projects listed in Tables 4.13-1 and 4.13-2. Therefore, the Projects would contribute to both the cumulative short- and long-term impacts on state, county, and local economies, but the effects would be beneficial.

Temporary Housing

Temporary housing for the Projects would be required for construction workers who are not hired from local areas. Given the current vacancy rates, the number of rental housing units in each area, and the number of hotel/motel rooms available in the vicinity of the Projects, construction workers should not encounter difficulty in finding temporary housing. If construction of the Projects occurs concurrently with other projects, temporary housing would still be available but may be slightly more difficult to find and/or more expensive to secure. Regardless, these effects would be temporary, lasting for the duration of construction, and there would be no long-term cumulative impact on housing from the Projects. Further, Transco's offshore construction workers for the Rockaway Project would sleep on the lay-barge, which would cause no impacts on temporary housing facilities.

Infrastructure and Public Services

The cumulative impact of the Projects, and the other projects listed in Tables 4.13-1 and 4.13-2, on infrastructure and public services would depend on the number of projects under construction at one time. The small incremental demands of several projects occurring at the same time could become difficult for local police, fire, and emergency service personnel to address. This problem would be temporary, occurring for the duration of construction, and could be mitigated by the various project sponsors providing their own personnel to augment the local capability or by providing additional funds or training for local personnel. No long-term cumulative impact on infrastructure and public services is anticipated due to the Projects because they would not result in any new public roads or residences, or an influx of any direct permanent hires.

Transportation and Traffic

Construction of the Rockaway Project would have a temporary impact on road traffic in some areas of New York City and could contribute to cumulative traffic, parking, and transit impacts if other projects (e.g., Phase II of the BQI Project) take place at the same time and in the same area. Traffic impacts associated with the Rockaway Project are expected at Flatbush Avenue, Marine Parkway Bridge, Cross Bay Boulevard, Cross Bay Veterans Memorial Bridge, and South Front Street.

The addition of traffic associated with the transportation of equipment and construction materials could contribute to cumulative regional traffic congestion, but any contribution of the Rockaway Project to cumulative traffic impacts would be temporary. Workers associated with the Rockaway Project would generally commute to and from the pipeline right-of-way or the M&R facility site during off-peak traffic hours (i.e., arriving before 7:00 a.m. and departing before 4:00 p.m.). Construction during Phase II of the BQI Project would create some lane closures along Flatbush Avenue during the time that Transco would commence rehabilitation of the hangar complex, but entrances to businesses, open spaces, parks, and recreational facilities would be maintained at all times. Appropriate traffic management and signage

would be set up and necessary safety measures would be developed in compliance with applicable permits and regulations for work in public roadways. National Grid would provide traffic safety personnel during periods of construction, and a tow-truck would be available for breakdowns in one-lane roads. Consequently, the lane closures and short-term construction effects of equipment movement, material deliveries and removal, and construction worker trips are not expected to have a significant adverse impact on traffic.

Due to extensive damage caused by Hurricane Sandy in October 2012, there may be continued construction associated with rebuilding or replacing residential and commercial structures that would affect traffic in the vicinity of the Rockaway Project, but information on the traffic associated with these activities is unavailable. Estimating the extent and duration of these construction efforts would be speculative.

Construction activities at Compressor Station 195 for the Northeast Connector Project could result in cumulative impacts on transportation if other projects (e.g., the upgrade of the power line servicing the facility) are completed at the same time and in the same area, but the impacts would be temporary and localized. The movement of construction equipment and materials deliveries to Compressor Station 195 could have a temporary impact on traffic, but once delivered, these materials would remain onsite for the duration of construction. Workers would carpool and commute during off-peak hours, which would reduce impacts on traffic. Transco would obtain any required permits for use of roads and would comply with weight limitations and any restrictions on roadways. Therefore, no significant, long-term cumulative impacts on transportation are anticipated.

Conclusions for Socioeconomics

In general, the effects of the Projects on socioeconomic conditions, while minor, would be viewed as positive, and would include increased temporary employment and increased sales and/or tax revenues. Other major projects in the areas would likely have similar impacts on the economy. Thus, the cumulative effects of the Projects on the economy likely would be positive.

4.13.12 Cultural Resources

Cumulative impacts on cultural resources in New York City could occur if other projects were to impact the same historic properties as the Rockaway Project. Past disturbances to cultural resources in the Rockaway Project area have typically been related to accidental disturbances, intentional destruction, or vandalism, lack of awareness of historical value, and construction and maintenance operations associated with existing roads and utility lines. The other projects listed in Table 4.13-1 that are defined as federal actions would include mitigation measures designed to avoid or minimize additional direct impacts on cultural resources. Where direct impacts are unavoidable, mitigation would occur before construction. Additionally, Transco developed a plan for the Rockaway Project to address unanticipated discoveries of cultural resources and human remains in the event they are discovered during construction. Therefore, the Rockaway Project may incrementally add to the cumulative effects of other projects that occur at the same time, but this incremental increase would not be significant.

As discussed in Section 4.10, the Rockaway Project would directly affect one property that is listed in the NRHP. Hangars 1 and 2, which would be rehabilitated for the M&R facility, are contributing resources to the Floyd Bennett Field Historic District. The interior of the hangars would be cleaned, stabilized, and repaired, and the exterior would be rehabilitated to preserve its historic character. The M&R facility would be located inside the hangar complex, but Transco would install 74 bollards and several signs on the exterior of the hangars. There would be long-term visual impact associated with the exterior changes; however, we do not anticipate significant adverse impacts on visual resources due to construction or operation of the M&R facility.

Two properties in the vicinity of the BQI Project area were determined to be listed in or eligible for listing in the SRHP and NRHP: Floyd Bennett Field Historic District and the Marine Parkway-Gil Hodges Memorial Bridge. Because the BQI pipelines are/would be located beneath the Flatbush Avenue right-of-way and TBTA property, including under the Rockaway Inlet, the BQI Project would not affect any portion of these properties nor would it introduce any permanent visible features into the settings of the sites. While no evidence of archaeological sites was identified along the pipeline route, National Grid committed to providing an archaeological monitor for any construction activities with the potential to affect undisturbed soil horizons in archaeologically sensitive areas. As a result, the Negative Declaration for the BQI Project concluded that construction of the pipelines would not cause a significant adverse impact on architectural, historic, or archaeological resources.

Construction activities at Compressor Station 195 would be limited to the existing station site. This area has been disturbed by previous construction activities at the site. The proposed upgrade of the power line servicing the compressor station would occur on disturbed lands adjacent to Bryansville Road and within the existing station site. Neither project is expected to affect historic properties. Transco developed a plan to address unanticipated discoveries of cultural resources and human remains during construction at the site.

Based on the above discussion, we do not believe that significant cumulative impacts on cultural resources would result from the Projects.

4.13.13 Air Quality and Noise

Construction of the Projects and the other projects identified in Tables 4.13-1 and 4.13-2 would all involve the use of heavy equipment that would generate emissions of air contaminants, fugitive dust, and noise. Construction emissions and noise would be emitted at different times and locations in the Project areas.

4.13.13.1 Air Quality

With the exception of GHG emissions, air impacts would be localized and confined primarily to areas in which projects occur. The combined effects of multiple construction projects occurring in the same areas and timeframes as the Projects could temporarily add to the ongoing air quality effects of existing activities. The contribution of the Projects to the cumulative effects of all foreseeable projects as a result of construction activities would be minor and temporary. The other projects have varying construction schedules and would take place over relatively large geographic areas.

Emissions produced as a result of the operation and maintenance of the Rockaway Project would not contribute to or cause a violation of any AAQS; therefore, maintenance and operation activities associated with the Rockaway Project should not result in a significant adverse impact on regional air quality and would not add significantly to the long-term cumulative impact of other projects.

Mobile source emissions from construction equipment and vehicles as well as minor air emissions would be generated during construction of Phase II of the BQI Project, but these emissions would be short term in duration and are not expected to be significant. Mitigation measures would be employed as necessary to maintain ambient air quality during construction activities. The incremental natural gas supply that would be provided to National Grid by the Projects would facilitate conversions from fuel oil to natural gas in heating systems in New York City. National Grid estimates that displacement of fuel oil consumption due to the BQI Project could reduce daily GHG emissions by 11,357 metric tons of CO_2e (National Grid, 2011), which could result in cumulative improvements in regional air quality.

Operational emissions from Compressor Station 195 would result from combustion exhaust associated with gas-fired engines and from fugitive sources. Transco's proposal to replace three gas-fired reciprocating engines with two new electric motor drives as part of the Northeast Connector Project would result in a reduction in annual operating emissions from the site, which could result in cumulative improvements in air quality in the vicinity of Compressor Station 195. None of the other projects listed in Table 4.13-2 are expected to result in operational emissions in the vicinity of this site.

4.13.13.2 Noise

The impact of noise is highly localized and attenuates quickly as the distance from the noise source increases. Therefore, cumulative noise impacts could occur if one or more of the other projects are constructed at the same time and in the same location. For example, Transco's hangar rehabilitation at Floyd Bennett Field would occur concurrently with construction of Phase II of the BQI Project. Based on the schedule and the proximity of these activities, there may be some cumulative noise impacts. The duration of any cumulative effect would be short because the noise impacts would occur during the construction period. During operation, the BQI Project (which involves buried pipelines) is not expected to generate noise, and noise at the M&R facility is expected to be imperceptible at the nearest NSA. Some of the other projects listed in Table 4.13-1, such as the commercial development projects, could result in an increase in ambient noise levels during operations, but these would occur at sites outside the area of noise impact for the Rockaway Project. Therefore, we do not believe that the Rockaway Project would contribute significantly to cumulative onshore noise impacts.

We do not expect that offshore construction activities associated with the Rockaway Delivery Lateral would contribute to cumulative noise impacts onshore due to the ambient background noise of the ocean (i.e., wind and wave action). Transco's use of a vibratory hammer could cause behavioral changes in some marine mammals and other species that migrate near the offshore construction site during active pile driving events. These pile driving activities could contribute to cumulative noise impacts beneath the ocean surface if other offshore projects are occurring in the same area and at the same time. We identified three other offshore projects in the vicinity of the Rockaway Project (defined generally as the area of the New York Bight off the coast of Rockaway Beach): the dredging and beach restoration project at Rockaway Beach, the Port Ambrose LNG Project, and the offshore wind project. The beach restoration project would be under construction at the same time as the Rockaway Project, but noise impacts mostly would occur along the shoreline and at dredge sites farther removed from the Rockaway Project area. The other projects would be constructed after the Rockaway Project, and regardless, are located far enough away from the route of the proposed pipeline that it is unlikely they would contribute to cumulative noise impacts in the same marine areas.

Construction activities at Compressor Station 195 would result in a temporary increase in noise at NSAs in the vicinity of the site. Cumulative impacts due to construction noise would result if other projects (e.g., the upgrade to the power line servicing the site) are constructed at the same time and in the same area, but the impacts would be short term, localized, and limited to daytime hours. During operation, there would be a slight increase in noise (1.9 dBA or less) at NSAs in the vicinities of Compressor Stations 205 and 207 due to the uprates at these sites, but the noise levels at the NSAs would be below the FERC standard of 55 dBA. The modifications at Compressor Station 205 could result in cumulative impacts if Transco's Leidy Southeast or Virginia Southside Expansion Projects result in an increase in noise at nearby NSAs; but those projects, like the Northeast Connector Project, would be required to meet the FERC's standards for noise at compressor stations. The modifications proposed for Compressor Station 195 would result in a slight decrease in noise (between 0.6 and 1.6 dBA) at NSAs in the vicinity of this site, which would be a beneficial effect. Therefore, we do not believe that the Northeast Connector Project would result in cumulative noise impacts.

4.13.14 Reliability and Safety

The Projects would be designed, constructed, operated, and maintained in accordance with or to exceed the DOT Minimum Federal Safety Standards in Title 49 CFR Part 192. These regulations, which are intended to protect the public and to prevent natural gas facility accidents and failures, include specifications for material selection and qualification; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion. Once the pipeline is in place, the operation and maintenance program would include: ground patrol of the onshore pipeline corridor, weekly inspection of valve settings, observing other construction activities, and annual leak detection surveys. Consequently, we do not believe that the Projects would result in any cumulative operational safety impacts among the pipelines and other projects identified in Tables 4.13-1 and 4.13-2.

4.13.15 Climate Change

The GHG emissions associated with construction and operation of the Projects were identified in Section 4.11.1.2. Emission of GHGs from the proposed Projects would not have any direct impacts on the environment in the Project areas. Currently, there is no standard methodology to determine how the relatively small incremental contributions of the Projects to GHGs would translate into physical effects on the global environment. The GHG emissions from the construction and operation of the Projects would be negligible compared to the global GHG emission inventory. Additionally, burning natural gas emits less CO_2 compared to other fuel sources (e.g., fuel oil or coal).

Because fuel oil is used as an alternative to natural gas in the region in the New York City area, it is anticipated that the Projects would result in the displacement of some fuel oil use, thereby potentially offsetting some regional GHG emissions. National Grid (2011) estimates that conversions from fuel to natural gas due to the incremental natural gas supply provided by the Projects to the BQI Project could result in a decrease in daily GHG emissions of 11,357 metric tons of CO_2e. The proposed modifications at Compressor Station 195, which include replacing three gas-fired reciprocating engines with two new electric motors, would result in a reduction in annual emissions of GHGs from this facility.

4.13.16 Conclusion

A majority of the cumulative impacts identified would be temporary and minor when considered in combination with past, present, and reasonably foreseeable activities. Long-term cumulative economic benefits may result from the Projects. The creation of jobs, increased wages, purchases of local goods and services, and tax revenues from the Projects would result in short-term and minor cumulative benefits. The Projects could contribute to an increase in ambient air quality due to conversions from fuel oil to natural gas in heating systems in New York City. As noted above, National Grid (2011) estimates that fuel conversions associated with the incremental gas supply provided by the Projects could result in a decrease in daily GHG emissions in New York City.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS OF THE ENVIRONMENTAL ANALYSIS

The conclusions and recommendations presented in this section are those of the FERC environmental staff. Our conclusions and recommendations were developed with input from the NPS, EPA, USACE, NOAA Fisheries, and the City of New York as cooperating agencies. The federal cooperating agencies could adopt this EIS per 40 CFR 1506.13 if, after an independent review of the document, they conclude that their permitting requirements and/or regulatory responsibilities have been satisfied. These agencies would present their own conclusions and recommendations in their respective and applicable decisions.

We determined that construction and operation of the Projects would result in limited adverse environmental impacts, which would mostly occur during construction. As part of our review, we developed specific mitigation measures we believe would appropriately and reasonably reduce the environmental impacts resulting from construction and operation of the Projects. We believe that environmental impacts would be reduced to less than significant levels if the Projects are constructed and operated in accordance with applicable laws and regulations, Transco's proposed mitigation, and our recommendations. Therefore, we are recommending that our mitigation measures be attached as conditions to any authorization issued by the Commission. A summary of the anticipated impacts from the Projects and our conclusions regarding impacts are provided by resource area below.

5.1.1 Geology

The overall effect of the Projects on topography and geology would be minor. The primary impacts would be associated with onshore grading and excavation activities and with offshore dredging and jetting. Following construction, the onshore workspaces on the Rockaway Peninsula and at Compressor Station 195 (with the exception of areas covered by new structures) would be returned to pre-construction conditions. At the M&R facility, the areas affected by excavations would be paved or covered in gravel.

Utilization of the HDD method would eliminate impacts on existing geologic conditions between the HDD entry and exit points for the Rockaway Delivery Lateral, including the shoreline crossing at Rockaway Beach and Jacob Riis Park within the GNRA. To minimize the potential for cave-ins and running sand conditions along the drill hole during construction, Transco would install a large diameter casing at the onshore entry site and excavate a subsea pit at the offshore exit site. Transco would also utilize drilling fluid (primarily bentonite and water) suitable for the subsurface conditions along the drill path, maintain proper penetration and flow rates during drilling, and monitor the downhole annular pressure, volume of drilling fluid, and cuttings returning to the entry pit. Additionally, a drilling fluid engineer would be present throughout the HDD activities to monitor and manipulate the weight and viscosity of the drilling fluid.

Transco initially proposed to allow the offshore excavation areas to infill by natural sedimentation processes, but modified its proposed action to an active backfill in response to comments from cooperating and other agencies. Transco would configure the discharge nozzles on the third pass of the jet sled to expel sediment behind the sled and into the trench to provide backfill as the pipeline is lowered beneath the seabed. Additional backfill would be provided by sloughing of the trench sidewalls during jetting and by natural infill as sediments migrate across and settle into the trench. Following installation of the pipeline, Transco would conduct a hydrographic survey to document seafloor elevations along the pipe trench as well as other offshore excavation areas. Transco would backfill any areas such that the seabed is restored to pre-existing conditions and ensure there is 4 feet of cover over the pipeline

and other facilities using native sediments withdrawn from the seabed. Transco would also add a top layer of native sediments over the drilling fluid and cuttings that collect within the offshore HDD exit pit. In addition to these activities, we are recommending in Section 4.6.3.2 that Transco implement a post-construction hydrographic monitoring plan to ensure that the contours of the seafloor are fully restored along the subsea pipeline. With the implementation of all these measures, there would be no permanent impact on the seabed as a result of pipeline construction.

No active mines or mineral resources are located within one mile of the proposed Rockaway Project facilities or within 0.5 mile of Compressor Station 195. Additionally, the nearest offshore borrow pit to the Rockaway Delivery Lateral is located about 2.3 miles to the east. An offshore borrow pit is an area dredged to obtain seabed sediment for use at another site (e.g., sand for beach nourishment projects). Therefore, the Projects would not affect mineral resources.

The geologic units underlying the Rockaway Project area consist of Wisconsin glacial deposits and Holocene beach and near-shore unconsolidated sediments that are continuously worked by wave action. The near-surface deposits at Compressor Station 195 consist of soils formed in residuum from metamorphic rock with a depth to bedrock greater than 60 inches. The probability of encountering significant paleontological resources in either of these areas is low.

Seismic hazards, soil liquefaction, and karst terrain/sinkholes are unlikely to impact the proposed facilities for the Projects. Although the probability of a hurricane making landfall in Kings and Queens Counties, New York is low in any given year (0.2 percent), the probability of these counties experiencing hurricane-force winds within a 50-year period is high (86 percent). It is unlikely that the Rockaway Delivery Lateral would be affected by a hurricane, particularly at the shoreline crossing where it would be installed at a depth of about 100 feet below ground level, but the M&R facility could be impacted by winds or flooding associated with a major storm. Hurricanes are not identified as a hazard for Compressor Station 195, which is located about 115 miles inland.

We received several comments that regulator valves at the M&R facility could become stuck in the open position due to salt water corrosion in the event of submersion due to flooding, which potentially could result in pipeline failures at low pressure downstream delivery points. The regulator and isolation valves would be installed at least 3 feet above the floor of the M&R facility, which would reduce the risk that this equipment would be damaged by a flood. Additionally, pressure protection controls (e.g., multiple regulators and valves) would be in place on both the Transco and National Grid systems to mitigate risks associated with the failure of a regulator valve due to floods.

To minimize impacts from a hurricane or flooding, Transco would construct the M&R facility in compliance with all applicable DOT standards as well as City of New York building codes, which were updated in 2008 to acknowledge that the city is in a "hurricane prone region." These codes include design requirements to ensure the integrity of new construction under extreme weather conditions. Additionally, in response to hurricane forecasts, Transco could shut off valves and electrical systems and secure the facility prior to a major storm making landfall.

5.1.2 Soils

The primary soil and sediment disturbances associated with the Projects would occur at the onshore workspace for the HDD entry point and tie-in to the National Grid pipeline; along the offshore pipeline segment from the HDD exit point to the tie-in with the LNYBL; and at Compressor Station 195. Transco would implement the mitigation measures contained in its Plan for the Rockaway Project and the FERC Plan for the Northeast Connector Project to minimize onshore impacts on soil resources. Transco's Plan is based on the FERC Plan, which specifies measures for segregating topsoil, controlling

erosion and sedimentation, and restoring disturbed areas following construction. We find Transco's Plan to be acceptable. As discussed above, Transco would backfill the offshore pipe trench to restore the seafloor to ambient conditions. Additionally, we are recommending in Section 4.6.3.2 that Transco implement a post-construction hydrographic monitoring plan to ensure that the contours of the seafloor are fully restored along the subsea pipeline.

Transco developed and would implement the measures in its SPCC Plan and Construction Spill Plans to minimize the potential for spills and leaks of hazardous materials to occur during construction. These plans identify and describe procedures for preventing and responding to spills and leaks, including clean-up of affected soils. We find these plans to be acceptable for addressing spills and leaks that occur on land.

No known soil contamination sites were identified within 0.5 mile of the Projects. Based on the urban nature of the Rockaway Project area, it is possible that previously unidentified areas of contaminated soil could be encountered during construction. If this occurs, Transco would implement its *Unanticipated Discovery of Contamination Plan*, which outlines measures for the proper handling and disposal of contaminated media. We find this plan to be acceptable. We also note that the NYCDEP recommends that Transco develop a *Construction Health and Safety Plan* for construction activities in areas where humans would be exposed to disturbed soils.

5.1.3 Water Resources

Groundwater

The Rockaway Project is located within the Long Island aquifer system, which underlies all of Kings and Queens Counties, New York. This system is not currently used in New York City as a public source of drinking water, but a number of developments are being implemented as part of the Water for the Future Program to supplement the city's water supply, including reactivating the groundwater supply system in southeastern Queens County. The recharge zone for this system, which includes all of Kings and Queens Counties, is designated as the Brooklyn Queens SSA. Compressor Station 195 is located above the Piedmont and Blue Ridge Crystalline Rock Aquifer, which is not classified as a SSA.

The closest wells to the Rockaway Project are located approximately 3.0 miles to the northwest. These wells, which are associated with New York City's Groundwater System, would not be affected by construction. An active water well providing Compressor Station 195 with potable water is located within the station yard. Additionally, one well that provides potable water to an adjacent residence is located within 20 feet of the station boundary. Impacts on these wells are not expected because blasting would not be required and Transco would implement its SPCC Plan to prevent or cleanup spills or leaks of hazardous materials during construction. As noted above, we find Transco's SPCC Plan to be adequate for addressing spills and leaks that occur on land.

Groundwater may be encountered during installation of the HDD segment of the Rockaway Delivery Lateral, but construction is not expected to result in any adverse impacts on groundwater. Construction activities at Compressor Station 195 would not directly affect groundwater resources because the groundwater occurs at depths greater than the proposed limits of excavation. Perched or near surface groundwater at Compressor Station 195, if present, could be affected by soil disturbing activities and/or trench dewatering. These impacts would be minimized or avoided through implementation of the FERC Plan as well as any applicable state permits for dewatering.

Groundwater resources in the vicinity of Compressor Station 195 and the onshore construction areas associated with the Rockaway Project could be vulnerable to contamination if there is an

inadvertent surface spill of hazardous materials during construction. Transco would implement the measures identified in its SPCC Plan and its Construction Spill Plans to minimize the potential for groundwater impacts associated with an inadvertent spill. As indicated above, we find these plans to be adequate for addressing spills or leaks that occur on land. In addition, Transco would implement its *Unanticipated Discovery of Contamination Plan*, which outlines measures for the proper handling and disposal of contaminated groundwater that may be encountered during the Rockaway Project. We find this plan to be acceptable.

Surface Waters

The only surface water that would be affected by the Projects is the Atlantic Ocean. No surface waters are present within the proposed workspaces associated with the onshore pipeline, M&R facility, pipe storage yard, or Compressor Station 195.

Offshore excavations for the pipeline and anode bed (i.e., post-lay jetting, hand jetting, and dredging) would impact ocean waters by disturbing bottom sediment resulting in increased turbidity and suspended solids. In general, these effects would be localized and of short duration. Transco used an ECOM to evaluate the duration and extent of the anticipated turbidity and suspended solids from offshore construction activities. The modeling results indicate that the areas closest to the excavations would be subject to the highest levels of turbidity and sedimentation, with the extent of turbidity plumes and the depth of the redeposited sediments diminishing as the distance from the jetting and dredging operations increase. For the post-lay jetting operation, for example, the modeling predicts that average trenching-induced sedimentation greater than 1.2 inches would be confined to the area within 100 feet of the trench centerline, and that average trenching-induced sedimentation would not exceed 0.4 inch at distances greater than 800 feet from the trench.

The remainder of the offshore pipeline, including the crossing of the shoreline, would be installed by HDD. Dredging activities associated with the HDD exit pit would have similar turbidity and sedimentation impacts to those discussed above for jetting. Because the HDD exit hole would be located in the ocean, the drilling operation would result in a planned release of drilling fluid into the offshore exit pit. The drilling fluids are expected to remain within the HDD exit pit and are not expected to cause a significant amount of turbidity. Impacts outside the pit could occur in the event of an inadvertent release of drilling fluid. Transco would implement measures outlined in its HDD Monitoring and Contingency Plan to minimize the risk of HDD complications and the potential for inadvertent releases of drilling fluid outside the exit pit.

In comments on the draft EIS, both the USACE and NOAA Fisheries recommended that Transco prepare a response plan for offshore releases of drilling fluid which occur outside the HDD exit pit. Therefore, we are recommending in Section 4.3.2.3 that Transco file a revised HDD Monitoring and Contingency Plan to include response procedures for an offshore inadvertent release of drilling fluid.

Transco would hydrostatically test the HDD pipeline segment before and after installation and would hydrostatically test the entire pipeline before it is placed in service. Transco would use about 5,200 gallons of fresh water and 573,500 gallons of seawater for these tests. The fresh water would be obtained from municipal sources. The seawater would be sucked into a submersible pump placed about 20 feet below the ocean surface. The seawater would be filtered by a mesh screen on the intake to prevent debris and foreign material from getting into the pipeline. An oxygen scavenger and non-oxidizing biocide would be added to the sea water to prevent corrosion of the pipeline, and a florescent dye would be added to help detect potential leaks. Following each test, the water would be pumped into a diffuser to re-oxygenate and disperse (dilute) the water as it is discharged to the marine environment.

Another 82,000 gallons of water would be used to hydrostatically test components installed at the M&R facility. This water would be obtained from a local municipal source or trucked to the site from another municipality. In Section 4.3.2.3, we are recommending that Transco consult with NYCDEP staff to address agency concerns regarding flow rates for withdrawals of municipal water. Following testing, the test water for the M&R facility would be discharged into the existing stormwater drainage system that runs under the hangars on NPS property.

Approximately 46,000 gallons of water would be required for hydrostatic testing of the piping modifications at Compressor Station 195. Transco would obtain this water from the onsite potable water well and discharge it to an upland area within the station site in accordance with applicable state permits.

Accidental spills and leaks of hazardous materials associated with barges and other vessels (e.g., fuel or oil) could result in a degradation of water quality and/or impacts on wildlife and aquatic resources. Transco stated in its SPCC Plan that emergency response procedures for offshore spills would be identified after a contractor has been selected. Therefore, we are recommending in Section 4.3.2.3 that Transco update its SPCC Plan for the Rockaway Project to include specific measures that would be implemented to identify, control, and clean up any accidental leaks or spills from offshore construction vessels.

Operation of the Rockaway Project periodically would impact water quality in the vicinity of the interconnection between the Rockaway Delivery Lateral and the LNYBL. Transco plans to perform periodic maintenance activities in accordance with 49 CFR 192 that would include accessing the buried subsea manifold approximately once every 7 years to install a removable launcher and conduct an internal inspection of the pipeline. The subsea manifold would be exposed using the hand-jetting method, displacing approximately 2,000 cubic yards of sediments. This would be approximately 16 percent of the sediments displaced during the initial hot-tap installation. The displaced sediments are expected to settle in a similar pattern but not extend as far from the area disturbed by construction.

Wetland Resources

The proposed Rockaway Delivery Lateral crosses one wetland area that is classified by the NYSDEC as a littoral, tidal wetland and by the National Wetland Inventory as a marine, intertidal unconsolidated shore. Transco is proposing to cross under this area using the HDD construction method. This method would avoid direct impacts on the wetland during construction. The potential impacts on the wetland would be from an inadvertent release of drilling fluid during the HDD. Because the drill path would be approximately 100 feet below grade when it crosses under the wetland, the likelihood of an inadvertent release reaching the surface is low. No wetlands are present at the proposed M&R facility, pipe yard, or Compressor Station 195.

5.1.4 Vegetation

Offshore activities associated with construction of the Rockaway Delivery Lateral could impact small amounts of turf algae if man-made structures are moved or buried during trenching operations or as a result of vessel anchoring. These effects would be minor and short-lived because the sandy sediments disturbed by construction would settle quickly, and the sediment accumulations caused by trenching would be minor.

The maintained area at the HDD entry workspace is the primary place where terrestrial vegetation would be impacted by construction of the pipeline. Assuming this area is vegetated at the time of construction, Transco would temporarily disturb about 0.7 acre of grass. Following construction, the workspace would be reseeded using a seed mix approved by the TBTA.

An additional 0.7 acre of vegetation within the GNRA, mostly on the golf course but also on the maritime beach, could potentially be disturbed by foot traffic to monitor the area for inadvertent releases of drilling fluid (another 0.7 acre of developed land would be affected by monitoring for inadvertent releases of drilling fluid). In response to comments from the NPS, we added a recommendation in Section 4.7.1.5 that Transco consult with the NPS to identify a protocol for coordinated monitoring of the drill path in the GNRA for the presence of sensitive species, including plants.

Construction of the M&R facility would remove approximately 1.9 acres of herbaceous vegetation growing on, in, and around the broken pavement surrounding the hangar complex at Floyd Bennett Field. These areas would be paved over following completion of the M&R facility, though the NPS has indicated that some areas around the perimeter of the site may need reseeding based on existing conditions.

Construction activities at Compressor Station 195 would disturb 25.2 acres of developed/maintained land and would require the removal of approximately 25 to 27 trees within hedgerows at the site. Transco would implement the measures in the FERC Plan to minimize impacts on vegetation at the site. Following construction, disturbed areas at the site that do not include new permanent facilities would be restored and reseeded using an appropriate seed mix.

5.1.5 Wildlife and Aquatic Resources

The wildlife habitats that would be crossed by or close to the Rockaway Project include offshore sandy bottoms and artificial hard-bottom reef structures and onshore maritime beach, scrub/shrub, maintained, and artificial surfaces with herbaceous vegetation. The proposed Rockaway Delivery Lateral would cross approximately 0.15 mile of onshore and offshore areas that have been identified by the FWS as significant land or water habitat complexes. Direct impacts on these complexes would be avoided by the HDD. The M&R facility is located in an area that the FWS has identified as a significant land habitat complex, but the area that would be affected is developed and mostly paved. Compressor Station 195 is located on developed/maintained lands; no significant or sensitive wildlife habitat areas are located within this site.

The impact of the Projects on wildlife species and their habitats would vary depending on the life history of each species and the habitats present in construction areas. More mobile species would temporarily be displaced from workspace and surrounding areas to similar nearby habitat during construction. Some displaced wildlife would return to the newly disturbed areas and adjacent, undisturbed habitats after completion of construction. Less mobile species, such as benthic organisms in the offshore construction area, may experience direct mortality or permanent displacement.

Marine Wildlife

Offshore construction activities with the greatest potential to affect marine wildlife include dredging and jetting, vessel anchoring, pile driving, the HDD, accidental spills of construction-related fluids (e.g., oil, gasoline, or hydraulic fluids), withdrawal and discharge of hydrostatic test water, and construction-related vessel traffic.

In the vicinity of the construction area, aquatic species could be impacted directly by the excavations and anchoring of vessels, or indirectly by the disturbance of sediments, including the suspension of sediments in the water column and the re-deposition of sediments that fall onto the seabed. The effects of turbidity and sedimentation would be temporary and localized. The areas disturbed by excavation and sedimentation would be recolonized by invertebrates. Based on a number of studies of the rate of benthic recovery, recolonization of benthic invertebrates in disturbed areas is expected to occur

within a period of 1 to 2 years (e.g., AKRF, Inc., et al., 2012; Germano et al., 1994; Hirsch et al., 1978; Kenny and Rees, 1994 and 1996; LaSalle et al., 1991; Murray and Saffert, 1999; Newell et al., 1998; NOAA Fisheries, 2013; and Rhoades et al., 1978). To ensure that benthic communities recover as expected, we are recommending in Section 4.6.3.2 that Transco file a post-construction benthic sampling and monitoring plan for the subsea pipeline. Therefore, no significant long-term impacts on benthic species are expected from the excavation activities.

The noise associated with the installation of 70 piles to support the HDD installation has the potential to affect marine wildlife. Transco's analysis indicates that noise from pile driving would not exceed the injury thresholds for marine mammals and sea turtles at any distance from a pile driving activity. The noise would exceed the injury threshold for fish within distances from the pile of 7.1 feet for fish weighing 2 grams or more and 13.1 feet for fish weighing less than 2 grams. The analysis suggests that sea turtle behavior could be affected by pile driving at a distance from the pile of 13.1 feet, and fish behavior could be affected by pile driving at a distance from the pile of 151 feet. The area encompassed by the behavior disturbance threshold for marine mammals is more expansive and would extend up to 2.86 miles from pile driving activities.

We received a comment from NOAA Fisheries that noise due to pile driving could be different than the levels predicted by Transco. Additionally, we note that noise generated by pile driving can vary depending on the method of pile driving used, water depth, and substrate. Therefore, we are recommending in Section 4.5.2.1 that Transco file a noise monitoring and mitigation plan to ensure that actual noise is consistent with predicted values and/or to reduce noise to acceptable levels.

Transco anticipates that approximately 12,000 to 15,000 cubic yards of drilling fluid and cuttings would be released at the offshore HDD exit location. This material would collect within the pit excavated at the exit site. To minimize the potential for toxic impacts on marine wildlife, Transco proposes to use a water-based drilling fluid with non-toxic additives as opposed to oil-based or synthetic-based mud systems. The combined initial concentrations of bentonite and other additives would likely be below 10 percent of the total volume of the drilling fluid. A discussion of the ecotoxicity of the drilling fluid is provided in Section 5.1.6 below.

Inadvertent releases of drilling fluid outside of the HDD exit pit are possible but not expected. Transco would monitor the HDD operation for inadvertent releases by checking the pressure and volume of drilling fluid returns. Transco did not identify any formal monitoring procedures for the area between the shore and the exit pit, but stated that inspection personnel on construction vessels would visually inspect the area at least twice daily. Corrective measures would be identified by Transco and its drilling contractor based on site-specific conditions at the time of the release. Transco would stop the drilling activity if the volume of inadvertent releases of drilling fluid creates a threat to public health and safety or if an inspection/evaluation is needed to determine if mitigation measures, including the use of additional additives, are necessary to maintain the integrity of the drill hole.

Transco has prepared an HDD Monitoring and Contingency Plan that describes the measures that would be implemented to prevent and identify inadvertent releases of drilling mud during construction, and to clean-up releases that occur onshore. As noted above, we are recommending in Section 4.3.2.3 that Transco file a revised HDD Monitoring and Contingency Plan to include additional procedures for offshore inadvertent releases of drilling fluid.

During the process of withdrawing water from the marine environment for hydrostatic testing, organisms that can physically fit through the mesh on the intake screen could become entrained in the pipeline, and larger organisms could be impinged on the screen. Entrained and impinged organisms would perish. Marine organisms also could be harmed if exposed to high concentrations of the oxygen

scavenger and biocide that would be added to the test water to prevent corrosion, but neither of these effects is expected to be significant.

As discussed in Section 4.6.3.2, the acute toxicity of the oxygen scavenger and biocide is generally low, and in the case of the biocide, would degrade during the 30 days the water is held in the pipe. Additionally, Transco would use a diffuser during discharge to re-oxygenate the water and disperse (dilute) the concentrations of the scavenger and biocide at a rate of 15:1 as they are released to the marine environment. We also note that the discharges would be subject to any requirements identified in applicable standards or permits, such as the New York State water quality standards or the NYSDEC's water quality certificate, including any requirements associated with discharge of the scavenger, biocide, and dye.

Offshore construction vessels would be expected to comply with USCG requirements for the prevention and control of oil and fuel spills and would be required to register for the EPA NPDES Vessel General Permit, which includes measures to protect against impacts associated with discharges incidental to the operations of commercial vessels. As indicated above, we are recommending in Section 4.3.2.3 that Transco update its SPCC Plan for the Rockaway Project to include specific measures that would be implemented to identify, control, and clean up any accidental leaks or spills from offshore vessels. Transco would also adhere to the USCG marine trash policy. These measures collectively would protect marine life from the potential for and impacts of trash, debris, and hazardous spills.

Potential impacts associated with vessel activities would include the possibility of vessels striking fish, turtles, or marine mammals, and noise associated with the operation of the vessels. In general, the potential for vessel strikes is low due to the limited offshore traffic and the depth of water in the offshore construction area. Underwater noise associated with vessels is expected to be similar to noise generated by existing heavy vessel traffic in the New York Bight. As such, we do not expect that the small number of vessels associated with the Rockaway Project would have any significant effect on the existing underwater noise environment in the vicinity of the pipeline.

Transco would not actively maintain the seafloor in the offshore right-of-way. During operation, Transco would need to access the subsea manifold approximately once every 7 years to install a temporary launcher and conduct an internal inspection of the pipeline. The impacts associated with maintenance activities would be similar to construction impacts, but on a much smaller scale. The maintenance activities would result in minor, temporary impacts on the benthic habitat at and around the subsea manifold. No significant adverse effects on benthic habitat are expected from pipeline operation or maintenance activities.

Marine Mammals

Although there is no specific marine mammal foraging habitat in the vicinity of the Rockaway Delivery Lateral, there is the potential for seven marine mammal species (gray seal, harbor seal, harp seal, short-beaked common dolphin, bottlenose dolphin, harbor porpoise, and right whale) to occur in the area during construction. Our analysis regarding effects on marine wildlife as discussed above would also apply to marine mammals and their prey. The activity with the greatest potential effect on marine mammals would be the pile driving, which could generate noise that may not be masked by existing background vessels or ambient noise. It would take about 60 seconds of continuous driving to install (and remove) each individual pile, and Transco estimates that all piles would be installed (and removed) over a period of approximately 10 days (each).

Transco is consulting with NOAA Fisheries and recently submitted an application for an IHA for Level B harassment of the seven marine mammal species with the greatest potential to occur in the

offshore construction area. As part of its request, Transco proposed several mitigation/monitoring procedures to minimize impacts on marine mammals resulting from pile driving. These include use of soft-start procedures for the vibratory hammer, monitoring the area within 3.0 miles of pile driving for behavioral impacts on marine mammals, and shutdown procedures if abnormal behaviors are observed in a marine mammal in the monitoring area. We have reviewed Transco's proposed mitigation measures, but we have not completed our consultations with NOAA Fisheries regarding impacts on marine mammals. Therefore, we are recommending in Section 4.5.2.2 that Transco not begin offshore construction activities until FERC staff receives written comments from NOAA Fisheries, and NOAA Fisheries has issued an IHA to Transco.

Terrestrial Wildlife

Transco proposes to utilize the HDD construction method for a majority of the onshore portion of the pipeline. As a result, no temporary or long-term impacts on federally and state-designated significant habitats are anticipated. The HDD would cross under Rockaway Beach and Jacob Riis Park and would not impact the ground surface within the GNRA, except by foot traffic to monitor the drill path drilling HDD operations. The foot traffic is not expected to affect terrestrial wildlife or their habitats. Additionally, we are recommending in Section 4.7.1.5 that Transco consult with the NPS to identify a protocol for coordinated monitoring of the drill path for the presence of sensitive species.

The sole onshore area that would be impacted by pipeline construction is the HDD entry workspace and tie-in to the National Grid pipeline north of Jacob Riis Park. The HDD operations at this site would disturb less than an acre of grass (assuming the area is vegetated at the time of construction) in an area that is routinely mowed by the TBTA. This area provides marginal habitat for wildlife and would be restored after construction in accordance with Transco's Plan. As noted above, we find Transco's Plan to be acceptable. During operation, Transco would not actively maintain the onshore right-of-way, and the land within the GNRA would continue to be managed for existing uses by the NPS.

The M&R facility would be constructed within an existing airplane hangar complex at Floyd Bennett Field and would utilize temporary workspace in adjacent paved areas. These areas provide marginal habitat for terrestrial wildlife species. Construction activities at the M&R facility (e.g., noise) would likely have a minor and temporary effect on nearby wildlife species. Because the proposed facilities would be located within the hangar complex, post-construction operation and maintenance activities are not expected to have any significant impacts on surrounding wildlife.

Activities at Compressor Station 195 would occur within the existing station yard, which provides marginal habitat for wildlife. Therefore, construction, operation, and maintenance activities associated with the Northeast Connector Project would have a minor and temporary effect on wildlife species at this site.

Migratory Birds

Potential impacts on migratory birds would be minimized by Transco's route, site, and workspace selections for the Projects, which avoid wooded, scrub/shrub, or natural grass habitats. While waterbirds use the shorelines of the Rockaway Peninsula for foraging and cover, Transco's use of the HDD method to install the Rockaway Delivery Lateral under the beach would avoid or minimize impacts on birds in this area. We believe these measures would minimize the effects of the Projects on migratory birds.

5.1.6 Fisheries and Aquatic Resources

The offshore segment of Transco's proposed pipeline is located in a marine area that supports EFH for 21 species, diadramous and marine fisheries, and a number of fish and shellfish species with ecological, commercial, or recreational importance. Our analysis regarding the effects of pipeline construction on marine wildlife as discussed above would also apply to EFH and fisheries resources. These include impacts associated with vessel anchoring, pile driving, the HDD, accidental leaks or spills of hazardous materials, withdrawal and discharge of hydrostatic test water, and construction vessel traffic.

Construction of the offshore pipeline would directly disturb approximately 29.0 acres of seabed due to dredging and jetting. Benthic species in these areas most likely would perish. Dredging and jetting would also create turbidity plumes in the water column that could clog fish gills, obscure visual stimuli, and reduce food intake for benthic filter feeders. Some demersal fish that are adapted to higher turbidity environments could be drawn to the sediment-generating activities, but most juvenile and adult pelagic fish would likely swim away from the plumes. Turbidity and suspended sediment concentrations could impact bivalves (e.g., surfclams) and other benthic organisms by causing suffocation. It is estimated that up to 45.2 acres of seabed could be affected by sedimentation of up to 1.2 inches.

Transco's ECOM indicates that the duration of the turbidity plumes would be short-lived (e.g., no more than 3.0 hours following jet sled trenching) with the depth of sedimentation decreasing with further distance from the trench. Based on historical data and a study conducted by Transco and reviewed by FERC staff, sediments along the pipeline route do not contain contaminants that exceed NYSDEC TOGS thresholds (with the exception of one near-surface sample), so impacts associated with suspension and re-deposition of contaminated sediments are not expected.

Transco would mitigate for any short-term loss of surfclams due to sedimentation by coordinating with the New York surfclam fishing community to see if it is possible to harvest in the vicinity of the proposed pipeline in the months immediately prior to construction. Transco additionally would conduct monitoring during construction and would adjust activities (e.g., reducing the speed of the jet sled) to reduce excessive turbidity. These measures would decrease the detrimental effects of turbidity and sedimentation. As a result, it is expected that the benthos in the affected areas would recover quickly through recruitment and other processes. Additionally, as noted above, we are recommending in Section 4.6.3.2 that Transco file a post-construction benthic sampling and monitoring plan for the subsea pipeline to ensure that benthic communities recover as expected.

As indicated above, Transco proposes to excavate a pit at the offshore HDD exit site to collect and contain anticipated releases of drilling fluid and cuttings during the HDD operation. Based on the cohesive properties of the bentonite mixture in seawater, the drilling fluid is expected to settle out and remain stable at the bottom of the pit. According to Transco, the drilling fluid would consist of a water-based mud containing bentonite and associated additives that are not expected to create acutely toxic conditions for benthic fauna, but Transco has not identified the specific additives that would be used. Therefore, we are recommending in Section 4.6.3.2 that Transco file an assessment identifying the specific additives that would be used in the HDD drilling fluid, the material safety data sheets for each additive, the concentration and dilution rates for each additive, an evaluation of the toxicity of each additive, and an evaluation of the potential for bioaccumulation of each additive in the food chain. We also are recommending that Transco file comments from NOAA Fisheries on the assessment of the drilling fluid additives.

As noted above, Transco would configure the discharge nozzles during the third pass of the jet sled to expel sediment behind the sled and into the trench to provide backfill as the pipeline is lowered beneath the seabed. Additional backfill would be provided by sloughing of the trench sidewalls and by

natural infill as sediments migrate across and settle into the trench. Following installation of the pipeline, Transco would conduct a hydrographic survey to document seafloor elevations along the pipe trench as well as other offshore excavation areas. Transco would backfill any areas such that the seabed is restored to pre-existing conditions and there is 4 feet of cover over the pipeline and other facilities using native sediments withdrawn from the seabed. Transco would also add a top layer of sediments over the drilling fluid and cuttings that collect within the offshore HDD exit pit. In addition, we are recommending in Section 4.6.3.2 that Transco file a post-construction hydrographic monitoring plan for the subsea pipeline to ensure that subsea contours are restored. As a result, there would be no permanent impact on the contours of the seafloor due to pipeline construction.

5.1.7 Special Status Species

Special status species are those for which federal or state agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species classified as threatened or endangered; species considered as candidates or petitioned for federal listing by the FWS or NOAA Fisheries; and species that are designated as state-listed or receive special management considerations. Impacts on special status species would be similar to those described above for terrestrial and marine wildlife.

For the Rockaway Project, we consulted (either directly or indirectly through Transco) with the FWS, NOAA Fisheries, and state resource agencies regarding the presence of federally listed or proposed species in the construction areas. Based on these consultations and our own analyses, we have determined that construction and operation of the Rockaway Project would have *no effect* on fin whale and humpback whale; *may affect, but would not likely adversely affect*, shortnose sturgeon, leatherback sea turtle, Kemp's ridley sea turtle, green sea turtle, loggerhead sea turtle, roseate tern, piping plover, and seabeach amaranth; and *may affect, and is likely to adversely affect*, right whale and Atlantic sturgeon.

We previously requested that the FWS and NOAA Fisheries consider the draft EIS as the official BA for the Rockaway Project. Each agency has initiated its review of our determinations of effect for federally listed species, but consultation with each agency is ongoing. Consequently, we are recommending in Section 4.7.4 that Transco not begin construction activities for the Rockaway Project until we complete our consultations with the FWS and NOAA Fisheries.

For the Northeast Connector Project, federally listed threatened and endangered species that may occur in the vicinity of Compressor Stations 195, 205, and 207 include the Indiana bat, bog turtle, and swamp pink. Activities at Compressor Stations 205 and 207 and activities within the existing fenceline at Compressor Station 195 are covered by agreements between Transco and the FWS, which exempt modifications of existing Transco facilities from further review for impacts on federally listed species. In correspondence with Transco, the FWS-PFO concluded that the proposed construction activities outside the existing fenceline at Compressor Station 195 would not adversely affect the bog turtle. Based on these agreements and correspondence, we have determined that the Northeast Connector Project *may affect, but would not likely adversely affect* Indiana bat, and would have *no effect* on bog turtle and swamp pink. No further consultation for these determinations is required.

In addition to the federally listed species, a number of state-listed species could occur in the vicinity of the Project areas in New York, New Jersey, and Pennsylvania. Given the nature of these species and the measures that would be implemented by Transco, we believe that impacts on state-listed species would be adequately avoided or minimized.

We received a comment from the NPS that staff from the Natural Resource Management Division at the GNRA should accompany Transco during pedestrian monitoring of the drill path between the

months of March and September to ensure that impacts on piping plovers or any other sensitive species (such as seabeach amaranth and seabeach knotweed) are avoided. Therefore, we are recommending in Section 4.7.1.5 that Transco consult with the NPS to identify a protocol for coordinated monitoring of the drill path.

5.1.8 Land Use and Visual Resources

Construction of the Rockaway Project would impact approximately 20.1 acres of land and 1,546.9 acres of marine areas. Following construction, lands within the pipeline right-of-way, facility workspace, pipe yard, and temporary access roads would be allowed to revert to their pre-construction land uses and cover types. Operation of the Rockaway Project facilities would permanently encumber 71.5 acres, including approximately 69.5 acres for the new permanent rights-of-way for the pipeline and cathodic protection system and 2.0 acres for the M&R facility.

Construction activities at Compressor Station 195 would affect 25.2 acres of developed/maintained land within the existing station site. Following construction, disturbed areas that do not include new permanent facilities would be restored to pre-construction land uses and cover types. The entire area within Compressor Station 195 would continue to be used for natural gas transmission service during the operations phase of the Northeast Connector Project.

There are no residences within 50 feet of the proposed construction areas for the Rockaway Project; the nearest residential community is approximately 0.3 mile to the west. In addition, other than rehabilitation and reuse of Hangars 1 and 2 for the M&R facility, no buildings would be affected by the Rockaway Project.

Construction activities at Compressor Station 195 would be confined to the existing station yard. There are no residences within 50 feet of the proposed construction workspace, but there are several homes in the vicinity of Compressor Station 195 that would experience an increase in noise during construction. Transco's proposal to replace three gas-fired compressors with two new electric motor drives would result in a slight reduction in ambient noise conditions in the vicinity of Compressor Station 195 during operations.

The Rockaway Project is subject to a federal Coastal Zone Consistency Review. Transco consulted with the NYSDOS for review of the Rockaway Project under New York State CMP and LWRP policies. Transco determined that the Rockaway Project would not have a significant adverse impact on coastal resources and would be consistent with the applicable policies of the LWRP. In November 2013, the NYSDOS requested that Transco prepare and submit a plan for stakeholder outreach (especially directed at beach users) for offshore construction activities associated with the Rockaway Project. Transco submitted the requested *Outreach Plan for Offshore Construction* to the NYSDOS on December 17, 2013. The NYSDOS subsequently concurred with Transco's consistency assessment on December 26, 2013.

Approximately 81.5 percent of the proposed pipeline would be located offshore on submerged lands owned by New York State. The remainder of the pipeline would be constructed beneath federal lands, both onshore and offshore, administered by the NPS (17.9 percent) and on land owned by the TBTA (0.6 percent). The M&R facility would be constructed on NPS lands at Floyd Bennett Field. In addition, Transco is proposing to lease a privately owned 5.0-acre commercial site in Elizabeth, New Jersey for a pipe yard.

The NPS lands that would be affected by the Rockaway Project are associated with the GNRA. The proposed pipeline would cross 0.57 mile of land and offshore areas within GNRA boundaries. Of

this, 0.32 mile would be located within Jacob Riis Park. Impacts on the park would be minimized by Transco's use of the HDD construction method. No construction activities would occur in the park except for foot traffic to monitor for inadvertent releases of drilling fluid. It is possible that use of the golf course at the park could decline for a temporary, short-term period during the spring/summer of 2014 as a result of construction noise, but Transco would erect tents and/or screens around the HDD machinery to help mitigate this effect. Construction noise due to operation of HDD equipment at the entry site would be less than 55 dBA in the vicinity of the beach and would not likely affect users of the beach.

Transco has proposed a permanent 50-foot-wide right-of-way over the pipeline across Jacob Riis Park, Rockaway Beach, and the offshore area under the GNRA. During operations, Transco would periodically walk and inspect the onshore right-of-way and conduct leak detection surveys once a year, but no alterations would be made to the land cover during these inspections. Additionally, there would be no restrictions on existing uses of the park along the right-of-way. Therefore, the Rockaway Project would have no impact on current land uses or cover types within Jacob Riis Park or Rockaway Beach. Additionally, as noted above, Transco prepared an *Outreach Plan for Offshore Construction* at the request of the NYSDOS. Under the plan, Transco would communicate information regarding offshore construction activities to beach users via signs, a website, newspaper advertisements, and public information sessions (as warranted). We find this plan to be acceptable.

Within Floyd Bennett Field, the M&R facility would be constructed within a 1.1-acre historic hangar complex, which would be rehabilitated as part of the Rockaway Project. The complex most recently was used as a storage area for supplies and equipment and by emergency response teams after Hurricane Sandy, but the hangars are in disrepair. Access to the hangar complex has been restricted by the NPS due to safety concerns, so construction activities would not impact any current uses of the structures. Operation of the M&R facility would require the use of approximately 2.0 acres of land, including the lease of the hangar complex and the establishment of two permanent right-of-way easements for the inlet and outlet piping that would connect the facility to the National Grid pipelines along Flatbush Avenue. GNRA traffic would not be impacted by operation of the M&R facility.

There are a number of managed honey bee colonies on Floyd Bennett Field. Members of the public have expressed concern that the noise and vibrations caused by operation of the M&R facility could disturb these colonies. Transco conducted a study to assess the potential effects of vibration during operations at the M&R facility. The analysis indicates that operation of the proposed M&R facility would have no effect on the honey bee colonies, which are located about 270 feet to the east of the hangar complex.

No significant or long-term impacts on surfclam harvests or fish populations available for commercial harvest or recreational catch are expected. Transco would advertise its plans and schedule to allow commercial fishermen to remove any fixed fishing gear from the construction area before construction begins. In addition, as noted above, Transco would work with the local fishing community to coordinate a surfclam harvest in the offshore work area in the months prior to construction. With offshore construction scheduled to begin no sooner than spring 2014, surfclam trawlers would have a few months to harvest the project area before construction.

Commercial, fishing, and recreational vessels not associated with the Rockaway Project would be advised to avoid a 2.55-mile-long, 0.95-mile-wide safety zone established around the temporary offshore work area. The safety zone would begin 0.5 mile from shore and extend 1,000 feet beyond the existing LNYBL approximately 3.0 miles from the shoreline. The zone would be marked by a network of 14 buoys placed along the perimeter of the area. Transco would employ a full time escort boat and would use project tug boats to intercept non-project vessels and dissuade them from entering the safety zone. Non-project vessels seeking to move along the coast (east/west direction) would be directed through the

0.5-mile area of the ocean between the shoreline and the safety zone, and non-project vessels traveling seaward of the safety zone would be directed around the safety zone 3.0 miles seaward of the shoreline. Therefore, construction of the Rockaway Project would have no significant effect on commercial, fishing, or recreational vessel traffic.

The offshore pipeline would cross one active and two inactive subsea cables. Transco developed a preliminary installation plan for the active cable crossing. The plan assumes that the active cable is buried at a depth of 9 feet below the seabed, which would be sufficient to install the pipeline over the cable and provide 4 feet of cover over the pipeline. The plan includes a contingency in the event that the cable is buried less than 8 feet below the seabed, which would require installing the pipeline with less than 4 feet of cover at the cable crossing. Transco is currently finalizing the details of the installation plan with its construction contractor and would consult with the owner of the cable when the plan is finalized. We are recommending in Section 4.8.4.3 that Transco file a finalized cable crossing plan and documentation of consultation with the cable owner regarding the plan. In the event the cable is buried less than 8 feet below the seabed, we also are recommending that Transco file documentation that the USACE approves of its contingency plan. No special construction methods or techniques are required for crossing the inactive subsea cables.

Construction of the Rockaway Project would impact the visual character of the Rockaway Peninsula during the estimated 4 months it would take to build the offshore pipeline and complete the HDD operation. The barges and support vessels used in trenching and pipe lay operations would be visible from the shore for a majority of this time, but the visual impact would be mitigated by the distance of the vessels from the beach, which would range from 3,000 feet to more than 2.5 miles (see Figure 2.3.1-1 and Appendix P). Offshore construction vessels would be visible from residential neighborhoods, but the HDD exit point is located more than a mile from the closest residences and, at this distance, the vessels would appear small. The onshore construction activities at the HDD entry site would be visible from residential neighborhoods, some roadways, and from Jacob Riis Park and Fort Tilden. Transco would minimize the visual impact of these activities by erecting a tent and/or screens to shield the HDD equipment from view. There would be no significant long term visual impacts during operation of the pipeline.

The USACE has advised Transco that it would require a sign no smaller than 4-feet by 4-feet containing language regarding the location of the pipeline at the shoreline crossing as a condition to any permit it may issue for the Rockaway Project. Transco would work with the USACE and NPS to confirm the requirements for the sign and select a design, size, and location that is acceptable to both agencies.

The hangar complex at Floyd Bennett Field that would house the M&R facility is currently in disrepair and has experienced significant structural damage. As part of the Rockaway Project, the hangars would be rehabilitated to accommodate the M&R facility. Transco is proposing a rehabilitated exterior appearance that would restore the hangars' appearance and enhance the visual character of the Floyd Bennett Field Historic District in accordance with a design that would be approved by the NPS, FERC, and New York SHPO. As such, no significant adverse impacts on visual resources are anticipated due to construction or operation of the M&R facility.

5.1.9 Socioeconomics

Construction of the Projects would not have a significant impact on local populations, employment, housing, or the provision of community services. The primary demand on local services would be in the event of an emergency such as a gas leak or fire. Transco has existing emergency response procedures in place that comply with the DOT's regulations in Title 49 CFR Part 192. Transco

would meet regularly with local emergency response officials to share emergency response plans, pipeline location information, and background information on natural gas pipeline operations.

Construction activities associated with the Projects, particularly the Rockaway Project, could result in short-term impacts on transportation infrastructure, primarily due to increased traffic flows associated with movement of construction vehicles, personnel, and equipment, and from potential damage to local roadways due to traffic by heavy construction equipment. Traffic on the Rockaway Peninsula or in Brooklyn could be temporarily interrupted when necessary for construction equipment and materials to cross roadways, but these interruptions would likely last 5 to 10 minutes and would be managed in accordance with applicable NYSDOT and local New York City requirements. Transco would acquire permits for loads exceeding 80,000 pounds, as necessary, and would adhere to applicable New York City and New York State regulations regarding traffic, weight, and truck restrictions. Any road surfaces that are damaged would be repaired to pre-existing or better condition. As such, we do not expect construction of the Rockaway Project to have a major impact on road traffic or use. Transportation impacts associated with the Northeast Connector Project would be minor.

The nearshore waters of the New York Bight produce significant quantities of commercially and recreationally important fish and shellfish. Offshore construction activities for the Rockaway Project could temporarily impact commercial and recreational fishing in the New York Bight. Most of the impact would be short term and associated with temporary increases in turbidity and sedimentation. As indicated above, Transco intends to coordinate with commercial and recreational fisherman prior to construction. Following construction, all recreational and commercial fishing areas would be restored with no restrictions. Therefore, operation of the pipeline would not have any permanent economic impact on the fisheries in the area.

There is no evidence that the proposed Projects would result in disproportionately high and adverse human health or environmental effects to minority or low-income communities.

5.1.10 Cultural Resources

For the Rockaway Project, Transco conducted a marine archaeological assessment for the offshore segment of the pipeline, terrestrial archaeological assessments for the onshore segment of the pipeline and M&R facility, and a historic structures assessment for the hangar complex at Floyd Bennett Field. No surveys or assessments were conducted at Compressor Station 195. Construction activities occurring within the fence line at this site are covered by an agreement between Transco and the Pennsylvania SHPO, which exempts modifications of existing Transco facilities from further review for impacts on historic properties. Additionally, in correspondence with Transco, the Pennsylvania SHPO concluded that no historic properties are present in the area outside the existing fenceline at the station site. We concur with this finding.

Transco's marine archaeological assessment of the offshore construction areas for the pipeline identified a paleochannel that may indicate the presence of intact sediments or landforms with the potential to contain significant buried cultural resource sites. The paleochannel is located 6 to 18 feet below the seafloor in an area where no trenching would occur; therefore, the channel would not be affected by construction of the pipeline. The surveys additionally identified two magnetic anomaly clusters and associated sonar targets identified as potential cultural resource sites, possibly shipwrecks. Avoidance of these anomalies plus 164-foot buffer zones was recommended. No other cultural resource sites were identified in the offshore construction areas. The New York SHPO reviewed and concurred with the results and recommendations of Transco's marine archaeological surveys. We also concur.

Transco filed a plan for avoiding the magnetic anomaly clusters and buffer zones during construction. These areas would be marked with buoys and identified on navigation charts used by construction vessels. The vessels would avoid anchoring in these areas. Additionally, onboard Transco representatives would monitor vessel movements to ensure that vessels, anchors, and anchoring cables do not cross the avoidance areas for each magnetic anomaly cluster. To date, we have not received comments from the New York SHPO on Transco's avoidance plan.

The route for the offshore pipeline segment crosses two inactive subsea cables that are greater than 50 years in age. We determined, in consultation with the New York SHPO, that these cables are not eligible for listing in the NRHP.

Transco's terrestrial archaeological assessment for the proposed M&R facility found that Hangars 1 and 2 are located in an area of Floyd Bennett Field with a low sensitivity for containing sites. The NPS nonetheless requested that an archaeologist monitor the excavation of test holes and trenches in and around the hangars to identify subsurface utilities within the complex. Excavation of the test holes and trenches was completed by Transco in May 2013. No significant cultural resources were identified as a result of the monitoring. Transco submitted a report describing the results of the investigation to the NPS in May 2013 and to the SHPO in October 2013. Both agencies concurred with the results of the monitoring and agreed that no additional monitoring in the vicinity of the hangars is warranted. We also concur.

Transco's terrestrial archaeological assessment for the onshore pipeline concluded that the workspace for the HDD entry site and tie-in to the National Grid pipeline is located in an area with a high sensitivity for containing sites. Transco initially recommended additional testing of this area to determine if construction activities in the workspace would affect archaeological sites. Following a site visit in October 2013, Transco proposed a change in methodology because the workspace was covered in construction gravel and partially disturbed due to construction of the National Grid BQI pipelines. Instead of testing, Transco proposed to conduct archaeological monitoring at the site during construction of the Rockaway Delivery Lateral. The New York SHPO concurred with Transco's proposal but requested a work plan for this activity. Transco subsequently submitted a work plan to the New York SHPO for review. The New York SHPO concurred with the work plan in November 2013. We requested changes to the plan, and Transco has made the requested changes.

The proposed M&R facility would be constructed within a hangar complex (Hangars 1 and 2) on Floyd Bennett Field, which is listed as a district in the NRHP and in the SRHP. Hangars 1 and 2 are considered contributing elements to the significance of the district. Transco prepared a draft and final HSR for Hangars 1 and 2 to serve as a planning tool for the proposed rehabilitation and conversion of the complex.

Transco prepared initial schematic drawings for the rehabilitation, which have been reviewed by the NPS and New York SHPO. Transco filed a Schematic Design Submittal and comments from the New York SHPO on the Submittal in July 2013. The New York SHPO commented that the proposed rehabilitation of the hangars appears to meet the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 CFR 68). Transco filed a set of construction drawings and plans for the proposed rehabilitation of Hangars 1 and 2 in October 2013.

Transco expects to submit final design and construction documents for the M&R facility to the FERC, NPS, and New York SHPO in 2014. Transco would prepare HABS documentation of the monitor structure (an addition within the hangar) after the final HSR and the full design and construction documents are accepted by the agencies and the Section 106 review process is complete.

Transco conducted a study to assess the potential effects of construction and operational vibration on the integrity of the hangar complex. The study found that vibrations resulting from individual pieces of construction equipment would not likely damage the structures, but simultaneous operation of multiple pieces of equipment or equipment operating close to walls could potentially cause damage. The study recommended that the engineering design identify vibration level thresholds for the structure, and that Transco prepare and implement a CPP to protect the integrity of the complex during construction. Transco's study found that vibrations resulting from the operation of the M&R facility would not affect the integrity of the complex provided a 1-inch buffer between the piping and buildings is maintained.

Transco filed a CPP for the hangar complex in October 2013. The CPP established a vibration level threshold for work in and around the hangars, and identified methods for vibration, building movement, and crack gauge monitoring during construction. The CPP also included vibration monitoring at Hangars 3 and 4, which abut Transco's proposed workspace.

In February 2014, the NPS completed its review of the effects of the Rockaway Project on the hangars at Floyd Bennett Field. The NPS determined that adaptive reuse of the hangars for the Rockaway Project would have no adverse effect on the Floyd Bennett Field Historic District, subject to completion of minor design details prior to construction.

The ACHP's regulations at 36 CFR 800.5 require federal agencies to assess effects on properties that are listed in, or eligible for listing in, the NRHP. Our Determination of Effect for the proposed reuse and rehabilitation of Hangars 1 and 2 will include an assessment of the proposed design relative to the Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36 CFR 68). Our Determination of Effect will be completed after all relevant documents are reviewed and approved by the FERC, NPS, and New York SHPO. If the Commission approves the Rockaway Project and we are unable to make a Determination of Effect at that time, the Commission would negotiate a Programmatic Agreement with the ACHP in accordance with the regulations at 36 CFR 1800.14(b)(1)(ii).

Transco prepared an Unanticipated Discovery Plan for the Rockaway Project to provide guidelines in the event that cultural resources or human remains are discovered during the course of construction. The FERC provided a copy of this plan to the NPS for review. Transco additionally prepared Unanticipated Discovery Plans for the Northeast Connector Project for construction activities in New Jersey (Compressor Stations 205 and 207) and Pennsylvania (Compressor Station 195). We find these plans to be acceptable.

Between December 2011 and April 2013, Transco and/or the Commission requested comments on the Projects from four federally recognized tribes. In a reply letter to the FERC dated March 4, 2013, the Delaware Nation expressed an interest in the Rockaway Project and requested copies of the cultural resources survey reports prepared by Transco. On March 8, 2013, Transco sent copies of the reports to the Delaware Nation. To date, none of the other tribes have commented on or expressed an interest in the Rockaway Project, and none of these tribes have commented on the Northeast Connector Project.

To ensure that our responsibilities under Section 106 of the NHPA are met, we are recommending in Section 4.10.4 that Transco not begin construction of the Rockaway Project until all outstanding survey and evaluation reports, the final design and construction drawings for Hangars 1 and 2, and any necessary treatment plans, have been reviewed by the appropriate parties, and we provide written notification to proceed.

5.1.11 Air Quality and Noise

Air Quality

The use of onshore diesel- and gas-powered equipment during construction of the Projects would result in emissions of some pollutants. These emissions would be temporary and would not result in a significant impact on regional air quality. Construction activities would produce fugitive dust due to land clearing and ground excavations, but the fugitive dust would cease when construction is completed.

The majority of new emissions associated with the Projects would result from the operation of four natural gas-fired heating units and an emergency generator at the proposed M&R facility. While no new compressor facilities would be required, modifications/upgrades would be made at Compressor Stations 195, 205, and 207. At Compressor Station 195, Transco proposes to replace three existing gas-fired reciprocating engines with two new electric motor drives, which would result in a decrease in operating emissions at this site. The uprates at Compressor Stations 205 and 207 would not result in an increase in operating emissions at these sites.

Emissions produced as a result of operation and maintenance of the Projects are unlikely to contribute to or cause a violation of any AAQS or result in a significant impact on regional air quality. Additionally, operational emissions are governed by SIP-approved programs both in New York and Pennsylvania; thus, a determination has already been made that the permitting programs when applied to stationary sources would not contribute to a violation of NAAQS or delay the attainment or maintenance of standards.

Noise

The noise level at the shoreline due to offshore pipeline construction is estimated to be 51 dBA, which would be less than the typical ambient noise level in the vicinity of the shore. Noise from offshore construction activities may have an effect on aquatic organisms as discussed above, but is unlikely to be noticeable from the shore.

Noise would be generated by equipment operating at the HDD entry site on the Rockaway Peninsula. Without noise mitigation measures, construction activities at this site would produce a significant increase in noise over ambient levels. Transco identified a number of measures that could be implemented to reduce noise, but final mitigation measures have not been selected. Therefore, we are recommending in Section 4.11.2.3 that Transco file a noise mitigation plan for construction activities at the HDD entry site for review and approval by the Director of OEP. Additionally, Transco would obtain an after-hours work authorization from New York City for drilling operations.

The estimated increase in noise due to construction activities at four of the five nearest NSAs to the M&R facility would be 2.1 dBA, which is unlikely to be detectable to the human ear. The estimated increase in noise at the nearest garden plots at the Floyd Bennett Gateway Park Community Garden would be 16.1 dBA and would be noticeable. This noise level would occur during peak construction periods and would be lower the rest of the time.

Transco's noise analysis indicates that the noise level at each NSA due to construction activities at Compressor Station 195 would be equal to or less than 55 dBA. The planned modifications at Compressor Stations 205 and 207 would not result in any construction-related noise at these sites.

Operation of the Rockaway Delivery Lateral is not expected to generate significant noise levels because no new natural gas compressor stations would be required for the pipeline. Noise attributable to

operation of the M&R facility should be significantly lower than a L_{dn} of 55 dBA at any nearby NSA, and the change in the noise level would likely be undetectable to the human ear.

Existing ambient noise levels at NSAs in the vicinity of Compressor Station 195 are expected to decrease as a result of the proposed modifications at the site, which include a number of mitigation measures to reduce noise. Based on information filed by Transco under Docket No. CP12-463-000, current noise levels at Compressor Station 205 due to station operations currently exceed the FERC sound requirement of 55 dBA at a nearby NSA, but Transco has committed to implementing additional mitigation measures to reduce the noise level at the station. For the Northeast Connector Project, noise levels at nearby NSAs would increase slightly as a result of the proposed uprate of the existing electric motor drives at Compressor Station 205, but we expect that noise levels would be less than 55 dBA at the nearby NSAs with the implementation of Transco's additional mitigation. Our analysis indicates that the sound level attributable to operations at Compressor Station 207 following the uprates would be less than the FERC sound requirement of 55 dBA at nearby NSAs.

To ensure that noise due to operations is consistent with existing ambient conditions and/or does not exceed our standards at Compressor Stations 195, 205, and 207, we are recommending in Section 4.11.2.3 that Transco provide noise surveys for each site to document noise levels at full load conditions. If the noise levels due to full load operations at the stations exceed these levels, Transco would be required to identify and implement additional mitigation measures to meet the appropriate standard.

Vibrations

As discussed above, Transco assessed the potential of vibration from construction activities to cause damage to the hangar complex on Floyd Bennett Field. Additionally, Transco prepared and would implement a CPP during construction. The CPP identified a vibration level threshold for the hangars and methods for vibration, building movement, and crack gauge monitoring during construction. Transco committed to providing an onsite engineer who would have stop-work authority in the event that any of the monitoring thresholds are exceeded. Corrective actions would be implemented, as appropriate, to protect the integrity of the structures from vibrations during construction.

Operation of the proposed M&R facility would result in vibration levels below the human limit of perception and would not be felt by other users of Floyd Bennett Field. Vibrations on the pipeline during operations would not affect the integrity of the hangars provided that a minimum buffer of 1 inch is maintained between the inlet and outlet pipes and the hangars where the pipes enter and exit the structures. The pipelines would enter/exit the hangar underground and between the piles supporting the structure to maintain this buffer.

Vibration levels at Compressor Station 195 would decrease as a result of the proposed modifications at the site. No change in vibration levels are expected as a result of the proposed upgrades at Compressor Stations 205 and 207.

5.1.12 Reliability and Safety

The pipeline and aboveground facilities associated with the Projects would be designed, constructed, operated, and maintained in accordance with or to exceed the DOT Minimum Federal Safety Standards in 49 CFR Part 192. The DOT regulations require that the pipeline be designed, at a minimum, to the appropriate Class location standard and that the spacing between mainline valves meets DOT requirements. Transco proposed a more robust design for the Rockaway Delivery Lateral than is required by the regulations, committing to design the entire pipeline to Class 4 standards. Additionally, with the exception of the HDD segment of the pipeline, which would be deeper, Transco would bury the offshore

pipeline at a depth of 4 feet below grade. Onshore, from the HDD entry point to the tie-in with National Grid, Transco would bury the pipeline at a depth of 3 feet below grade, would cover the pipeline with a concrete slab, and would backfill the remainder of the trench. Transco additionally would monitor pipeline pressures 24 hours per day.

Transco has developed a comprehensive Integrity Management Plan for their existing facilities that meets all applicable regulations. Transco would modify the existing Integrity Management Plan, as necessary, to incorporate the proposed facilities for the Projects. Transco also has a Pipeline Safety Monitoring Program in place that would ensure that the Rockaway Delivery Lateral is properly constructed. Transco is in full compliance with all existing regulations and guidelines from the DHS's TSA.

Transco's implementation of the above measures would help to protect public safety and the integrity of the proposed facilities such that the Projects would represent a slight increase in risk to the nearby public.

5.1.13 Cumulative Effects

Cumulative impacts represent the incremental effects of a proposed action when added to other past, present, or reasonably foreseeable future actions. Actions that potentially could impact resources also affected by the Projects include non-jurisdictional facilities, other energy projects, dredging and beach nourishment projects, post-Hurricane Sandy recovery projects, and private projects.

Transco designed the Projects to avoid or minimize impacts on the environment, and we have included recommendations in this final EIS to further reduce impacts. Each of the other projects considered in our cumulative impacts analysis similarly have been designed to avoid or minimize impacts on sensitive environmental resources. Additionally, it is expected that any significant impacts on sensitive resources resulting from these other projects would be mitigated. Mitigation generally leads to avoidance or minimization of cumulative impacts. Consequently, we anticipate a small incremental cumulative effect after the impacts of the Projects are added to those of other past, present, or reasonably foreseeable actions.

We received numerous comments during scoping for the Projects and in comments accompanying requests to intervene about cumulative impacts associated with development of natural gas reserves (including hydraulic fracturing) in the Marcellus Shale. Activities associated with the Projects would occur outside of the Marcellus Shale region. As a result, the local resources that may be affected by Marcellus Shale development would not be affected by the Projects, and local resources affected by the Projects would not be affected by development in the Marcellus Shale.

We also note that a majority of the natural gas to be provided by the Projects to National Grid (about 85 percent by volume) is replacement gas, which currently is provided to National Grid via the existing delivery point in Long Beach. A small portion (about 15 percent by volume) of the natural gas to be provided by the Projects to National Grid is incremental (i.e., additional). This additional supply could originate at any number of points along the interconnected interstate natural gas pipeline grid. As such, the effects of activities in the Marcellus Shale region are beyond the scope of the cumulative impacts analysis for the Projects.

5.1.14 Alternatives Considered

We evaluated the No Action Alternative, energy alternatives, system alternatives, route alternatives for the proposed pipeline, site alternatives for the M&R facility, and alternatives to the Northeast Connector Project.

The No Action Alternative would eliminate or delay the short and long-term environmental impacts identified in this final EIS, but the objectives of the Projects would not be met. Transco would not be able to provide 647 Mdth/d of natural gas to National Grid at a new delivery point on the Rockaway Peninsula. We evaluated the use of alternative energy sources and the potential effects of energy conservation, but these measures similarly would not satisfy the objectives of the proposed Projects.

Our analysis of system alternatives included an evaluation of existing natural gas pipeline systems that currently or eventually would serve the markets targeted by the Projects. In addition to an evaluation of these systems, we also evaluated whether the proposed Constitution Pipeline Project could meet the Projects' objectives while providing an environmental advantage over the Projects. None of the existing or proposed natural gas pipelines provide a new connection with National Grid's system on the Rockaway Peninsula in Queens County, New York. To create a new connection on the Rockaway Peninsula, these systems would need to be modified by constructing between 10 and 40 miles of new pipeline, which would result in greater environmental impacts than the Projects. For these reasons, none of the existing or proposed pipelines provide an environmental advantage over the Projects.

In addition to pipeline systems, we also evaluated five previously or currently proposed LNG terminals, including the Port Ambrose LNG Project, as system alternatives. None of these projects have been completely reviewed or approved for construction, and it would likely be years before they could be permitted and constructed, if at all. Consequently, it is unlikely that these LNG projects could meet National Grid's objectives within a timeframe reasonably close to the Projects. Additionally, because of the longer length of offshore and onshore pipelines to connect the LNG facilities to existing transportation systems, each of the LNG projects would have greater marine and terrestrial impacts than the Projects. We also note that none of the LNG terminal projects would provide a new connection with National Grid's system on the Rockaway Peninsula, which is a key objective of the Projects. For all these reasons, we do not consider the previously or currently proposed LNG terminal facilities to be reasonable, practicable, or environmentally preferable to the Projects.

We evaluated alternatives on Transco's system, including increasing supplies through its existing Long Beach facilities or delivering gas through its approved Northeast Supply Link Expansion Project and proposed LSE Project. None of these alternatives would meet the objectives of the Projects.

We evaluated four route alternatives to Transco's proposed route for the Rockaway Delivery Lateral, five alternative sites for the M&R facility, and alternative compressor station sites or a pipeline loop for the Northeast Connector Project. Because none of these alternatives would offer significant environmental advantages over the Projects, we eliminated them from further consideration.

We evaluated construction alternatives for the Rockaway Project to determine whether offshore environmental impacts could be reduced or mitigated by use of alternative methods. We did not identify any alternative construction methods that would be feasible or preferable to use of the post-lay jet sled for offshore trenching, the HDD crossing at the shoreline, or Transco's proposal to allow drilling fluid and cuttings to remain in the HDD exit pit. In addition, we found that the use of the proposed lay barge equipment would be preferable to the use of a dynamically positioned lay barge.

In summary, we have determined that the Projects, as modified by our recommended mitigation measures, are the preferred alternative.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission authorizes the Projects, we recommend that the following measures be included as specific conditions in the Commission's Order. We believe that these measures would further mitigate the environmental impacts associated with construction and operation of the Projects.

1. Transco shall follow the construction procedures and mitigation measures described in its applications and supplemental filings for the Projects (including responses to staff information and data requests), and as identified in the EIS, unless modified by the Commission's Order. Transco must:

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
    b. justify each modification relative to site-specific conditions;
    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
    d. receive approval in writing from the Director of OEP **before using that modification**.

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Projects. This authority shall allow:

    a. the modification of conditions of the Commission's Order; and
    b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to assure continued compliance with the intent of the environmental conditions as well as avoidance or mitigation of adverse environmental impacts resulting from construction and operation of the Projects.

3. **Prior to any construction**, Transco shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities for the Projects.

4. The authorized facility locations shall be as shown in the EIS, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, Transco shall file with the Secretary any revised detailed survey alignment maps/sheets for the Projects at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

    Transco's exercise of eminent domain authority granted under NGA Section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Transco's right of eminent domain granted under NGA Section 7(h) does not authorize it to increase the size of its natural gas facilities to

accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Transco shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas for the Projects that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area.**

   This requirement does not apply to extra workspace allowed by Transco's Plan for the Rockaway Project, the FERC Plan for the Northeast Connector Project, and/or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

   Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

   a. implementation of cultural resources mitigation measures;
   b. implementation of endangered, threatened, or special concern species mitigation measures;
   c. recommendations by state regulatory authorities; and
   d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of the Certificate and before construction begins**, Transco shall file Implementation Plans for the Projects for review and written approval by the Director of OEP. Transco must file revisions to the plans as schedules change. The plans shall identify:

   a. how Transco will implement the construction procedures and mitigation measures described in its applications and supplements (including responses to staff data requests), identified in the EIS, and required by the Order;
   b. how Transco will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
   c. the number of EIs assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
   d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
   e. the location and dates of the environmental compliance training and instructions Transco will give to all personnel involved with construction and restoration (initial and refresher training as the Projects progress and personnel change), with the opportunity for OEP staff to participate in the training session(s);

f. the company personnel (if known) and specific portion of Transco's organization having responsibility for compliance;
g. the procedures (including use of contract penalties) Transco will follow if noncompliance occurs; and
h. for each discrete facility, a Gantt or Project Evaluation and Review Technique chart (or similar project scheduling diagram), and dates for:

    i. the completion of all required surveys and reports;
    ii. the environmental compliance training of onsite personnel;
    iii. the start of construction; and
    iv. the start and completion of restoration.

7. Transco shall employ at least one EI for the Rockaway Project and one EI for the Northeast Connector Project. The EIs shall be:

    a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;
    b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
    c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
    d. a full-time position, separate from all other activity inspectors;
    e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
    f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plans, Transco shall file updated status reports with the Secretary **on a weekly basis for the Rockaway Project and a monthly basis for the Northeast Connector Project until all construction and restoration activities are complete**. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

    a. an update on Transco's efforts to obtain the necessary federal authorizations;
    b. the construction status of the Projects, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;
    c. a listing of all problems encountered and each instance of noncompliance observed by the EI during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
    d. a description of the corrective actions implemented in response to all instances of noncompliance, and their cost;
    e. the effectiveness of all corrective actions implemented;
    f. a description of any landowner/resident complaints that may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and

g. copies of any correspondence received by Transco from other federal, state, or local permitting agencies concerning instances of noncompliance, and Transco's response.

9. **Prior to receiving written authorization from the Director of OEP to commence construction of any facilities for the Projects**, Transco shall file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. Transco must receive written authorization from the Director of OEP **before placing the Projects into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Projects are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities for the Projects into service**, Transco shall file an affirmative statement with the Secretary, certified by a senior company official:

    a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
    b. identifying which of the Certificate conditions Transco has complied with or will comply with. This statement shall also identify any areas affected by the Projects where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

12. **Prior to construction of the Rockaway Delivery Lateral**, Transco shall update its HDD Monitoring and Contingency Plan to include response procedures for offshore inadvertent releases of drilling fluid. The updated plan shall be filed with the Secretary for review and written approval by the Director of OEP. ***(Section 4.3.2.3)***

13. **Prior to construction of the Rockaway Project**, Transco shall consult with NYCDEP staff to identify and address agency concerns regarding flow rates for withdrawals of municipal water for hydrostatic testing and file documentation of the consultation with the Secretary. ***(Section 4.3.2.3)***

14. **Prior to construction of the Rockaway Project**, Transco shall update its SPCC Plan to include specific measures that would be implemented to identify, control, and clean up any accidental leaks or spills from offshore construction vessels. This information shall be filed with the Secretary for review and written approval by the Director of OEP. ***(Section 4.3.2.3)***

15. **Prior to construction of the offshore portion of the Rockaway Delivery Lateral**, Transco shall file with the Secretary for review and written approval by the Director of OEP a noise monitoring and mitigation plan. The plan shall include:

    a. a description of the equipment and methods Transco would use to measure noise during installation of the 14- and 16-inch-diameter piles;
    b. a figure illustrating where the measuring equipment would be placed relative to the piles;
    c. provisions for reporting noise data to the FERC and NOAA Fisheries;

d. mitigation measures that would be implemented to reduce noise to acceptable levels if the noise exceeds predicted values (e.g., use of bubble curtains, isolation casings, or cushion blocks, or seasonal restrictions); and
e. comments on the plan from NOAA Fisheries. ***(Section 4.5.2.1)***

16. Transco shall not begin offshore construction activities for the Rockaway Delivery Lateral **until**:

a. the FERC staff receives written comments from NOAA Fisheries, Protected Resources Division regarding impacts on marine mammals and Transco's proposed mitigation measures;
b. NOAA Fisheries issues an IHA to Transco; and
c. the Director of OEP approves Transco's plans and notifies Transco in writing that the mitigation measures may be implemented and construction may proceed. ***(Section 4.5.2.2)***

17. **Prior to construction of the offshore portion of the Rockaway Delivery Lateral**, Transco shall file with the Secretary a post-construction benthic sampling and monitoring plan for review and written approval by the Director of OEP. The plan shall identify the duration of the monitoring period, the timing of sampling surveys, success criteria for assessing recovery of benthic species, and reporting requirements. Transco shall also file comments from NOAA Fisheries on the plan ***(Section 4.6.3.2)***

18. **Prior to construction of the Rockaway Delivery Lateral,** Transco shall file an assessment identifying the specific additives that would be used in the HDD drilling fluid, including:

a. the material safety data sheets for each additive;
b. the concentration and dilution rates for each additive;
c. an evaluation of the toxicity of each additive;
d. an evaluation of the potential for bioaccumulation of each additive in the food chain; and
e. comments from NOAA Fisheries on the assessment. ***(Section 4.6.3.2)***

19. **Prior to construction of the offshore portion of the Rockaway Delivery Lateral**, Transco shall file with the Secretary for review and written approval by the Director of OEP a 5-year plan for annual, post-construction, hydrographic monitoring of the seabed along the pipeline route. The plan shall identify the timing of annual surveys, success criteria for assessing restoration of the seabed, reporting requirements, and the implementation of remedial measures, if necessary. Transco shall also file comments from NOAA Fisheries on the plan ***(Section 4.6.3.2)***

20. **Prior to construction of the Rockaway Delivery Lateral**, Transco shall consult with the NPS to identify a protocol for coordinated monitoring of the drill path in the GNRA between the months of March and September for the presence of sensitive species, and file documentation of the consultation with the Secretary. ***(Section 4.7.1.5)***

21. Transco shall not begin construction activities for the Rockaway Delivery Lateral **until**:

    a. the FERC staff receives written comments from NOAA Fisheries, Protected Resources Division and the FWS regarding impacts on federally listed species;
    b. the FERC staff completes formal consultation with NOAA Fisheries/FWS, if required; and
    c. the Director of OEP approves Transco's plans and notifies Transco in writing that the mitigation measures may be implemented and construction may proceed. ***(Section 4.7.4)***

22. **Prior to construction of the offshore portion of the Rockaway Delivery Lateral**, Transco shall file with the Secretary a finalized crossing plan for the Neptune RTS cable and documentation of consultation with the cable owner regarding the plan. In the event that Transco is unable to maintain a minimum of 18 inches of separation between the pipeline and the subsea cable, as well as 4 feet of cover over the pipeline, Transco shall also file documentation that the USACE approves of its contingency plan. ***(Section 4.8.4.3)***

23. Transco shall not begin implementation of any treatment plans/measures (including archaeological data recovery); construction of facilities; or use of staging, storage, or temporary work areas, and new or to-be-improved access roads for the Rockaway Project **until**:

    a. Transco files all outstanding survey and evaluation reports, the final design and construction drawings for Hangars 1 and 2, any necessary treatment plans, and written comments from the NPS and the New York SHPO on all reports and plans for the Rockaway Project;
    b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected or a Programmatic Agreement has been executed; and
    c. the FERC staff reviews and the Director of OEP approves all cultural resource reports and plans, and notifies Transco in writing that the treatment plans/mitigation measures may be implemented and/or that construction may proceed.

    All material filed with the Commission that contains location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "**CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE.**" ***(Section 4.10.4)***

24. **Prior to construction of the Rockaway Delivery Lateral**, Transco shall file with the Secretary a site-specific noise mitigation plan for the HDD onshore entry location for review and written approval by the Director of OEP that incorporates the noise mitigation measures recommended in Report No. 2825 by Hoover and Keith, Inc.; identifies any deviations from these recommendations with stated justification; and specifies any additional or alternate mitigation that would be employed. ***(Section 4.11.2.3)***

25. Transco shall file a noise survey with the Secretary **no later than 60 days** after placing the modified Compressor Station 195 in service for the Northeast Connector Project. If a full load condition noise survey is not possible, Transco shall provide an interim survey at the maximum possible hp load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at Compressor Station 195 under interim or full hp load conditions exceeds existing noise levels at NSA no. 1 or an L_{dn} of 55 dBA at NSA nos. 2 and 3, Transco shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Transco shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. ***(Section 4.11.2.3)***

26. Transco shall file a noise survey with the Secretary **no later than 60 days** after placing the modified Compressor Station 205 in service for the Northeast Connector Project. If a full load condition noise survey is not possible, Transco shall provide an interim survey at the maximum possible hp load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at Compressor Station 205 under interim or full hp load conditions exceeds an L_{dn} of 55 dBA at any nearby NSAs, Transco shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Transco shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. ***(Section 4.11.2.3)***

27. Transco shall make all reasonable efforts to ensure its predicted noise levels from Compressor Station 207 are not exceeded at nearby NSAs and file noise surveys showing this with the Secretary **no later than 60 days** after placing the modified Compressor Station 207 in service for the Northeast Connector Project. If a full load condition noise survey is not possible, Transco shall provide an interim survey at the maximum possible hp load and provide the full load survey within 6 months. If the noise attributable to the operation of Compressor Station 207 at interim or full hp load exceeds an L_{dn} of 55 dBA at any nearby NSAs, Transco shall file a report on what changes are needed and shall install additional noise controls to meet the level **within 1 year** of the in-service date. Transco shall confirm compliance with this requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. ***(Section 4.11.2.3)***